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ABSTRACT

This report contains the proceedings from a conference on the problems of low literacy among single mothers. The seminar involved practitioners, policymakers, researchers, and funders. The report includes an executive summary, six papers grouped according to three topic areas, a seminar agenda, a list of participants, and a 57-item bibliography. "The Economy, Literacy Requirements, and At-Risk Adults" (Berryman) and "Literacy Skills Needed in the Workforce" (Uhalde) speak to the theme of the economy and workplace skills: new demands. "Assessing Literacy Skills and Gains in Job-Oriented Literacy Training Programs" (Sticht) and "Toward a Model of Alternative Assessment" (Sterling) address the theme of literacy skills measurement and program evaluation. "Optimal Programming" (Somerfield) and "Program Designs to Increase Basic Academic Skills" (Strumpf) address the topic of strategies for designing literacy programs for single mothers. (NLL)

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LITERACY AND THE MARKETPLACE

Improving the Literacy of Low-Income Single Mothers

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LITERACY AND THE MARKETPLACE

Improving the Literacy of Low-Income Single Mothers

Literacy and the Marketplace

Improving the Literacy of Low-Income Single Mothers

A report on a meeting of practitioners, policymakers, researchers, and funders

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"We've been supporting comprehensive job oriented demonstration programs run by four community-based organizations that help low-income single minority mothers who want to secure employment. When we invited representatives from the four sites to sit around the table during the first year and tell us what was happening, they sat there rather nonplussed, puzzled, and said, "I have never seen this before. We're going to have to do a lot of work to improve the skills so they can get jobs." So that's why we're here today, to talk about literacy, basic skills, and how people can get into the marketplace of jobs."

Phoebe Cottingham
The Rockefeller Foundation

"As we began to look at the whole question of basic skills, we wanted to think about what was going on in other employment and training programs for women across the United States. What we have learned is that the greatest motivator for the women who come to employment and training programs is the future well-being of their children. In the urgency of their job goal, the basic skill issues for them are secondary. They know they need to improve their basic skills but that isn't why they are coming to the program. They come to get a good job."

Cindy Marano
Wider Opportunities for Women

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Table of Contents

Executive Summary 9

The Economy and Workplace Skills: New Demands 21
The Economy, Literacy Requirements, and At-Risk Adults 22
Sue Berryman
Literacy Skills Needed in the Workforce 34
Raymond J. Uhalde

Literacy Skills Measurement and Program Evaluation 41
Assessing Literacy Skills and Gains in Job-Oriented Literacy Training Programs 42
Thomas G. Sticht
Toward a Model of Alternative Assessment 50
Richard Sterling

Strategies for Designing Literacy Programs for Single Mothers 57
Optimal Programming 58
Benita Somerfield
Program Designs to Increase Basic Academic Skills 64
Lori Strumpf

Seminar Agenda 72

List of Participants 73

Bibliography 76

Executive Summary

In the past two decades, the number of children living in single mother households has increased; that growth has been accompanied by a rise in the number of children living in poverty. Because of the increased number of poor children living in the United States — some 20 percent of all children, according to the Census Bureau — public policy attention has focused on strategies to improve the economic resources of single mothers and thus reduce the number of children who are at economic risk. One policy strategy that has been put forward is increasing the labor force participation of low-income single mothers. Many single mothers, however, face multiple barriers that impede their ability to obtain jobs, to stay in the labor force, and to progress in a career. A significant barrier is their lack of the literacy skills required by today's labor market.

In response to the problem of low literacy among single mothers, Wider Opportunities for Women, with funding from the Rockefeller Foundation, convened a meeting of practitioners, policymakers, researchers, and funders on January 14, 1988, to identify strategies for improving the basic literacy skills of low-income single mothers. Three major questions were addressed by seminar participants:

- What literacy skills are currently needed in the workforce, and what skills will be required in the workforce of the future?
- What are alternative strategies for assessing literacy skills and measuring progress for low-income single mothers?
- How can adult literacy programs most effectively meet the needs of single mothers?

Each question was addressed by a panel of two presenters, by a respondent, and by the total audience. In order to stimulate discussion, the presenters, each leaders in their fields, developed and presented papers relevant to the question to be addressed by their panel. During a luncheon session, literacy service

providers discussed their approaches to serving low-income single mothers to give a practitioner perspective to the seminar.

The Economy and Workplace Skills: New Demands

What literacy skills are currently needed in the workforce, and what skills will be required in the workforce of the future?

Presenter:
Sue E. Berryman, Director
Institute on Education and the Economy
Teachers College, Columbia University

Presenter:
Raymond Uhalde, Deputy Administrator
Office of Strategic Planning and Policy Development,
U.S. Department of Labor

Respondent:
Nathaniel M. Semple, Vice President and Secretary
Research and Policy Committee, Committee for Economic Development

Moderator:
Judith Gueron, President
Manpower Demonstration Research Corporation

Panelists and participants generally agreed that changes in the American economy increasingly require additional skills. Higher-order thinking, characterized by Sue Berryman as complex and involving "nuanced judgments, interpretation and uncertainty," ranked high among the skills that will be expected of workers.

Berryman noted that case studies of changes in the nature and structure of work in the insurance, banking, and textile-manufacturing industries reveal a significant shift away from mass production toward more flexible production. The new production mode has resulted in less need for "splintered knowledge and greater need for more systematic and abstract knowledge, the ability to understand multiple arrays of information, the rules governing them, and the relationships between arrays. . . . While many jobs in the past were based on the repetition of a particular set of well-defined tasks, jobs are now more likely to demand varied and unpredictable responses to a variety of stimuli and information." Workers will need both good basic skills and high-order thinking skills, even for jobs conceived as lower-skilled and especially in the more fluid and fast-paced service and manufacturing industries.

According to Berryman, the escalation of skill requirements in the labor force has implications for the setting of educational objectives for programs designed to improve the employment prospects of low-income single mothers, as well as for our education system more generally. While public primary- and secondary-school improvements may be important for long-run reduction in adult literacy, the consensus at the seminar was that these schools generally cannot be expected to meet the educational needs of adults with deficient basic skills.

Raymond Uhalde agreed that literacy requirements tend to be increasing. He presented research by the Hudson Institute that projects a growing mismatch between the skills of the youth population and the literacy requirements for jobs in the future, with a significant proportion of young adults possessing lower literacy skills than required for employment.

Uhalde discussed both the overall increase in skill requirements of the workplace and the diversity of these requirements. To the extent that literacy is to be taught in a functional (i.e., job) context, programs will need to be constantly changing to meet local labor market needs. Uhalde noted that "we are moving into an era where people need to be transferable across jobs and industries."

Uhalde also presented American Society for Training and Development survey results, which found many abilities beyond basic skills that workers need. Employers want entry-level employees who can progress within the firm. Requiring higher-order thinking skills for career mobility is not new among employers, but employers increasingly seek these skills for entry-level positions as well.

Nathaniel Semple added that the business community recognizes the need to invest in improving overall human resources to compete in a world that is "global, changing and unpredictable."

Seminar participants discussed the impact of these changes on the employment training and education systems and agreed that "higher-order thinking skills" must be integrated into even the most job-specific training for long-term labor market participation. This will be an important characteristic in training and educating single mothers.

Literacy Skills Measurement and Program Evaluation

What are alternative strategies for assessing literacy skills and measuring progress for low-income single mothers?

Presenter:
Thomas G. Sticht, President and Senior Scientist
Applied Behavioral and Cognitive Science

Presenter:
Richard Sterling, Director
Institute for Literacy Studies
Lehman College, City University of New York

Respondent:
Gordon Berlin, Deputy Program Director
Urban Poverty Project, Ford Foundation

Moderator:
Rebecca Maynard, Vice President
Mathematica Policy Research

The issue of measuring and assessing adult literacy skills and literacy gains sparked considerable debate among participants. There was general agreement that diagnostic assessment and periodic assessment of persons in literacy or employment training programs was valuable both to provide feedback to students and to determine program impacts. At issue were whether the standardized tests most frequently used to screen persons for jobs and/or training effectively measure the literacy skills of most adults and how well the test results correlate with performance on the job.

Seminar participants felt that there was little evidence to support the assumed correlation between performance on standardized tests like the Test of Adult Basic Education (TABE) or the General Equivalency Diploma (GED) and job performance. Service providers who operate literacy programs for low-income single mothers, for example, said that attainment of a GED did not necessarily reflect a person's overall literacy. Other providers were more concerned that tests like the TABE often screen out the most needy applicants from programs by measuring academic deficiencies, rather than abilities or work-related skills.

Tom Sticht and Richard Sterling proposed alternatives to the standardized tests for measuring adult basic skills and the gains made in a literacy program. Sticht discussed lessons from his experience developing tests for the Army and Navy. In both cases, traditional standardized tests had been used to assess the literacy skills of personnel. Sticht suggested that these tests be replaced by job-related reading tests. For example, Sticht designed job-related literacy measures that assess a person's ability in a particular job area. His system includes a general literacy measure, as well as measures for different modules in the training program. Sticht stressed that, with a little adjustment, he was able to scale the test to provide reading levels. He found that people who did well on the job-related literacy measures also did well on the general literacy measure.

Another literacy test he developed for the Navy was a measure of a person's background knowledge. The test measures what a person already knows about the work for which he or she will be trained. Sticht believes that tests similar to these can be developed in any program and can be scaled to allow comparisons with standardized tests.

Richard Sterling described an assessment/evaluation process for adult literacy students that is being piloted in the adult education program at Lehman College. Standardized tests are replaced with a process evaluation, divided into three parts. The first part, which consists of an open interview with staff members, attempts to measure the abilities students have when they enter the program. Participants are asked to record some of their accomplishments in writing and to select a document they are familiar with to read. Next, teachers design "projects to collect data that will document that program participants have acquired strategies, connected previous knowledge with new knowledge and applied the sum of new knowledge in various settings." Finally, students actively participate in determining whether they have achieved the goals they set for themselves. This process-oriented evaluation is designed to replace periodic testing.

Gordon Berlin responded critically to some assumptions of the assessment strategies proposed by both Sticht and Sterling. He stated that using standardized tests to predict or assess individual performance or even to assess gains is problematic. He noted that "tests are not good predictors of individual performance and are not meaningful when used to assess grade gains for individual learners; they are only significant for use as gross indicators." Nevertheless, he stressed that as "gross indicators of where someone belongs in structured literacy curricula, tests are external references that allow you to check comparable performances across programs and, therefore, are important." In addition, Berlin noted that individual progress in a literacy program can best be measured by "organized, structured, sequenced curricula with tests throughout each lesson objective assessing performance, each of those tests cumulating into larger tests." This kind of testing, combined with more qualitative teacher/student assessments of a program, provide the accountability called for by persons outside the program and by potential funders, and guide instruction and facilitate the transition to the workplace. Berlin also noted that there is a mass of literature which shows clearly that general achievement tests are very powerful predictors of how people will perform in the world of work.

The evaluation approach suggested by Sterling, Berlin noted, tends to be "extraordinarily subjective" and difficult to explain to persons outside the program. Berlin concluded that "if we throw away the standardized tests, which are

an external reference, we will fall to the lowest common denominator, where we will no longer be able to assess whether output has increased per unit of input."

The participant discussion of assessment revealed dissatisfaction with the most commonly used measures in employment training programs for single mothers. There was agreement that measures and standards must be available for program accountability and to provide meaningful benchmarks for program participants.

Strategies for Designing Literacy Programs for Single Mothers

How can adult literacy programs most effectively meet the needs of low-income single mothers?

Presenter:
Benita Somerfield, Special Advisor
Division of Adult Education
U.S. Department of Education

Presenter:
Lori Strumpf, President
Center for Remediation Design

Respondent:
Ruth Nickse, Director
Family Learning Center, Boston University

Moderator:
Michael Bailin, President
Public/Private Ventures

Presenters and other participants agreed that a number of supportive services are crucial if single mothers are to participate in and complete education and skills training programs. Michael Bailin noted that "optimal programming . . . may have as much to do with ancillary supports . . . as it does with any kind of curriculum or instructional techniques." The supportive services that are most important include provision of child care, transportation, health services, and counseling. Lori Strumpf stated that in training single mothers, "services must be integrated into a program which has education and employment at its core, [and] must include . . . child care services, optimally on-site, but certainly within the community, and training in parenting and family planning."

There was less agreement about the most effective training strategy to increase literacy skills among single mothers. Two strategies were discussed at

length: 1) functional context literacy training; and 2) competency-based, and often computer-assisted, instruction.

Literacy service providers emphasized the importance of providing instruction in the context of helping women achieve their primary goal, which is employment. In other words, the teaching of literacy skills must be integrated into or at least coordinated with employment training. Benita Somerfield indicated that recent U.S. Department of Education surveys of exemplary literacy programs for adults reveal that the more effective programs combine basic skills and occupational training. She stressed that people have to be prepared for the job market by "building a curriculum that reflects student goals, interests and needs." Karl Haigler of the U.S. Department of Education noted that in 1983 the General Accounting Office studied an Army basic-skills literacy program and mandated that any literacy program for use on duty time must incorporate job materials. Raymond Uhalde added that the U.S. Department of Labor is now trying to move the Army's Job Skills Education Program (JSEP) into the civilian population on a demonstration basis.

In addition to an emphasis on teaching literacy in a functional or job-oriented context, education programs for single mothers need to be learner-centered. According to Somerfield, "you need to know the goals and skills of your students, and let your instruction be designed to help them achieve those goals by building on their skills." Barbara Makris of Wider Opportunities for Women suggested that instructors use activities and materials rooted in the women's daily lives and their own experiences. Several other participants stressed the need for programs that are individualized and flexible to allow for individual student strengths and weaknesses. Adults who have ended their secondary schooling with a sense of failure need literacy programs that are sensitive to their possible discomfort in an academic environment.

A main point reiterated throughout the program design discussion was that the most effective programs are those that draw on the needs and strengths of the participants and the importance of initiatives that enable participants to feel a sense of belonging.

Several seminar participants commented that although there are general principles that can guide the design of programs for this population, there is "no quick-fix prescription" and that diversity in program approach needs to be encouraged. All agreed that literacy training for single mothers requires well-trained staff, adequate funding, and support services.

Participants raised the important policy question of how this kind of flexible, learner-centered program model could be accessible to the broad population of low-income single mothers who need such services. How can a quality program capable of tackling a very large problem and enough diversity to

accommodate the needs of a variety of people be nationally replicated? How can it be institutionalized?

Gordon Berlin expressed concern that it may be almost impossible to make such personalized programs available to millions of low-income single mothers, because they require "extraordinary" staff with the capability to develop special curricula tailored to the needs of individual students. He noted that given the high turnover rate among teachers in adult education programs, one cannot expect average program staff to be able to implement the kind of program model suggested. A replicable system for teaching basic skills should be the cornerstone of our approach to the problem.

Berlin also stressed that we cannot ignore the importance of the general literacy taught in elementary and secondary schools and in GED programs. We should not make a choice between functional context literacy and general literacy. We also need to teach people document literacy because jobs are changing dramatically and people have to be able to shift jobs. We need a teaching system that correlates all three literacies.

Berlin proposed that competency-based, computer-assisted instruction, such as the Comprehensive Competencies Program (CCP) developed by Robert Taggert at the Remediation and Training Institute, provides an alternative solution. According to Berlin, CCP has served 15,000 minority female heads of households and operates in 260 locales nationally, serving 50,000 persons a year and growing by 100 sites annually. Teachers who have used the system say that it maximizes their teaching time and helps students to achieve their individual goals because it is flexible, allowing individual components to be pulled out for individual students. Berlin added that the system combines structure and efficiency, thus freeing up resources for "caring, flexibility and counseling." He also noted that it facilitates accountability because tests are an integral part of the system.

Concern was expressed, however, that the CCP system, while interesting, had not been independently evaluated. Support was urged for such an evaluation. Barbara Dunn of the Remediation and Training Institute said that all of the CCP data collected by the individual sites has been sent to the institute and is being converted into tapes that will soon be made available for public use and review. However, as others noted, the CCP data pertains only to participants in a CCP program; it does not include any data to support an assessment of what achievement levels participants would have had in the absence of the intervention.

Some seminar participants objected to the suggestion that because a literacy approach has not been adopted on a widespread level, it is not valid. Benita Somerfield stressed that the learner-centered approach discussed earlier is not familiar to large numbers of program providers and has potential for wide replication.

While participants clearly saw the importance of addressing the literacy needs of large numbers of low-income single mothers, no resolution was reached as to whether a system such as CCP was more efficient and effective than a less centralized, functional context literacy approach.

Enhancing Literacy: Other Policy Issues

Several other issues were raised during the seminar. The need for a case management approach to coordinate the various services provided to participants in training programs was emphasized. Lori Strumpf noted that good case management is particularly important for a population such as low-income single mothers, who face an array of problems and often require coordinated, individualized services.

Sue Berryman observed that the instructional methods identified as effective for at-risk learners, including low-income single mothers, are effective for all learners. She noted that "we make distinctions between at-risk and not-at-risk learners, when in fact . . . some path-breaking work in cognitive psychology is suggesting that the only difference between at-risk and not-at-risk learners in schools . . . has to do with the ability of one group to tolerate a way of being taught that is not very effective for anybody."

A concern was also raised that children not be ignored when programs for single mothers are designed. As Benita Somerfield stressed, parents are the children's first teachers. She suggested considering parent-child literacy models that provide parenting skills, child literacy skills, and parenting literacy skills all under one roof. She mentioned the Even Start Act, new legislation that will make money available to states for such a program approach. Ruth Nickse discussed the Family Learning Center model, which is based on the premise that the education and training of adults and children has to be integrated. She said that there is tension between adults' need to have a job and the education needs of children. She added that the emphasis on workplace literacy and provision of day care is important but not sufficient. The family learning model attempts to address both the needs of parents and children by providing direct instruction to parents on how to become an enhancer of literacy in the home environment. This approach, she feels, could be replicated in adult basic education programs so that children get involved in the parents' learning process.

An important issue was raised by Cynthia Marano, executive director of Wider Opportunities for Women, at the conclusion of the seminar. Marano noted the difficulty of operating education and training programs that serve the multiple needs of low-income single mothers, while at the same time being held to a low-cost-per-participant program standard that defines job placement within a limited time period as the measure of program success. This is particu-

larly difficult when many women enter the program with low literacy skills or English as a second language. Quick job placement goals may undermine the mission of preparing skilled, flexible workers and may limit the futures of participants. Seminar participants agreed that the funding and performance standards that now define the development of literacy or employment programs for women with limited educational skills are generally insufficient for the task at hand.

The seminar ended with the recognition that many of the program options and strategies discussed throughout the day contribute greatly to the effective education and training of single mothers. Making them accessible to the broader population, however, will depend upon developing a new national priority directed toward the development of human capital — including single mothers. Changes in the workforce will require labor market participation by many whose education has not prepared them effectively for employment. Seminar participants agreed that it will take a substantial investment of resources and a commitment to new initiatives like those discussed throughout the day to meet this challenge.

THE ECONOMY AND WORKPLACE SKILLS

New Demands

The Economy, Literacy Requirements, and At-Risk Adults

Sue E. Berryman

Sue E. Berryman is director of the Institute on Education and the Economy, Teachers College, Columbia University.

Of the issues that this panel was asked to consider, one was, "What skills do you feel are needed for a low-income single mother to be considered literate and employable?" On one level, this sentence is a perfectly reasonable, unexceptional statement. Together, however, the terms in this sentence — "low-income," "single mother," and "literate" — subtly convey that the problem for this group is a lack of minimum levels of competence. Accordingly, they evoke an old distinction in education between mass education, aimed at producing minimum levels of skill, and elite or academic education, aimed at producing higher-order cognitive skills. In some respects the language of the educational reform movement mirrors this thinking — that we need to "get our basics right." Given the changes that are occurring in the American economy, I propose that improved basic skills may be an insufficient educational objective for all individuals, including low-income single mothers.

I am increasingly convinced that American economic changes and demographic realities may require fundamental reform in what all individuals need to learn and how they need to learn it. I am not sure what this restructuring will ultimately look like in our schools, second-chance programs, or corporate education; how it can be made to happen; or how long it will take. Nevertheless, I can briefly describe three strands of research that should help clarify the issues for both advantaged and disadvantaged populations, jog our assumptions, and move us closer to ideas of what these changes may be.

First Research Strand

The first strand is research on changes in the nature and structure of work and in the capacities required for work. My comments here are based primarily on a National Center on Education and Employment (NCEE) research program conducted by Drs. Thomas Bailey and Thierry Noyelle, economists at Columbia University. I discuss changes in three industries: insurance, banking

(both service industries), and textile manufacturing. Although concepts such as unit output and mass production are usually associated only with manufacturing industries, as I discuss later, concepts such as craft production, mass production, and flexible production have analogues in service industries. By "craft production" I mean highly customized production, often with hand tools and labor-intensive. For example, you can buy "ready-made" bookcases or hire a carpenter to build them into your home, the former being mass production and the latter, craft production. Flexible production tries to combine the customizing implicit in craft production at the cost savings of mass production. From the point of view of human capital development and schooling, the key change in the economy for both the manufacturing and service sectors is a shift from mass production to flexible production.

Computerization in the insurance industry has caused five distinct jobs to be folded into one. These five jobs were: messenger, file clerk, customer assistance clerk, claims adjuster, and policy writer. When the insurance industry ran on paper, it required file clerks to categorize the paper and messengers to move it among offices. Computerization virtually eliminated these jobs and combined the other three jobs. The customer assistance clerk had been essentially an order taker; he or she answered the telephone, recorded what the customer needed, and routed that request to either a claims adjuster or to the policy-writing group. With the advent of computers, the person who now answers the telephone is expected to complete these routine and not-so-routine interactions during one call. He or she works with a computer terminal and software that give him or her access to claims settlement files and to information about the nature of and rates for insurance coverage that the company offers. The computerization of policy-writing rules and the printing speed of laser printers allow — and therefore require — the person to customize insurance contracts.

Today the person who performs this combined job is often called a claims adjuster. However, the skills required to perform this job are greater than those associated with any one of the original five jobs. The job occupant is less an order taker than an advisory analyst. He or she has to have good communication skills and be able to help diagnose the customer's needs through an analytic series of questions and answers. The person needs less specific and splintered knowledge and more systematic and abstract knowledge — the ability to understand multiple arrays of information, the rules governing them, and the relationships between arrays. He or she also needs to be able to frame answers to less standardized requests. Insurance companies used to hire high school dropouts or graduates for the five jobs. They now hire individuals with at least two years of college for the restructured claims adjuster job.

This case provides us with a warning about using occupational projections

Higher-order thinking, characterized as complex and involving "nuanced judgments, interpretation and uncertainty," ranked high among the skills that will be expected of workers.

to infer future skill requirements. The name of a job can remain the same — as has the job title of claims adjuster — but change dramatically in content and skill requirements.

The banking industry has been subject to three forces:

- Increased international competition;
- Increased domestic competition as the result of deregulation; and
- Computerization.

Before computerization and deregulation, banking involved few services or "products," and its mode of operation was a mass production mode — the rapid and accurate processing of millions of a small array of different types of transactions. During this era, top bank management consisted of college graduate generalists; the bank branches operated with a branch manager, assistant manager, head teller, tellers, and clerk/typists who did the routine paperwork for activities such as opening accounts. The tellers were usually high school graduates with traditional accounting skills, and promotions to low-level management came from this group.

In the last decade bank deregulation has generated an explosion of services as banks compete for market shares. This explosion drives banks into a market and customer orientation — toward customizing. In other words, it has forced banks out of a mass production mode into a flexible production strategy, with consequent changes in skill requirements and staffing patterns. Today the teller job is highly routinized, simply a human alternative for customers who do not like to use automated banking services. The desk jobs, previously the clerk / typist jobs, are still the jobs that deal with customers' service needs. Thus, individuals in these jobs must now be able to analyze a much wider array of the customer's financial needs, understand the array of the bank's financial services, and, if possible, produce a match — in other words, make a sale. Banks find that they can hire part-time, less-educated help for the highly routinized teller jobs, but must hire college graduates for what used to be the clerk-typist jobs. Like the insurance industry, banks find that they need people who can analyze and deal systematically with a range of data. Promotions now come out of the desk jobs, not the teller jobs — in fact, tellers are essentially isolated from promotion opportunities in the bank. At the same time, the skill requirements at the top of the bank have also changed. Banks now need, not college graduate generalists, but highly trained specialists — financial analysts and computer systems analysts, for example.

The textile industry competes on the basis of cost, quality, service, and product choice. During most of the postwar era, the U.S. textile industry focused on cost cutting through the rationalization of the production of long runs of fabric. Since textile production still requires large quantities of less-

skilled labor and the basic textile technology has diffused widely, the U.S. industry has been vulnerable to competition from countries with cheap labor. In 1980 imports constituted 17 percent of the domestic textile market; by 1986 — just six years later — this had increased to 36 percent. In the face of this competition U.S. firms have entered a new wave of technological modernization and automation, the industry moving from forty-eighth out of sixty-one manufacturing industries in 1960 in average age of equipment, to second by 1980.

Still, developments in textile markets — indeed, in markets for almost all goods and services (recall banking) — have put limits on the industry's ability to use a mass production strategy. The greater segmentation of markets and the faster changing of styles have shrunk the market for large production runs of identical fabric. Even such a staple mass-produced commodity as denim now comes in dozens of weaves, colors, and finishes. Faster-changing seasons have also had their effect. In apparel, styles become obsolete much more rapidly. Thus, apparel makers are less likely to order large quantities of the same material. The changes in styles are reflected by increases in stock-outs and markdowns. Forced markdowns, which are necessary when retailers fail to sell items during the appropriate season, have increased by 50 percent during the last decade. Industry estimates suggest that losses from stock-outs, which occur when retailers run out of hot items, amount to 8 percent of sales.

Case studies of changes in the nature and structure of work in the insurance, banking, and textile-manufacturing industries reveal a significant shift away from mass production toward more flexible production.

Among U.S. textile producers it has now become an article of faith that the textile industry must become more "market driven" — that is, the industry must be capable of producing shorter runs of many more styles. Managers of every mill studied reported increases in the number of styles produced — for example, from three to thirty-five in two years; from one hundred to three hundred in five years.

In other words, although there will always be a market for basic textiles produced in long runs, the industry as a whole must also be able to produce a wider variety of goods, on shorter notice, and at a reasonable cost — in other words, must increase flexible production. The development of flexibility in production is fundamentally a process of reducing the cost differential between standardized goods produced in long runs and a more varied output produced in smaller batches. Custom-made products could always be acquired at a price. Ever since Henry Ford mobilized the labor of low-skilled factory workers through the assembly line to replace teams of skilled workers, technological innovations, at least in the United States, have almost always been synonymous with specialization of labor and mass production. Flexibility has usually been achieved by reversing Ford's process, moving back up the range of skill levels, shifting from specialized to general purpose tools and machines, and reorganizing how people get the work done.

The escalation of skill requirements in the labor force has implications for the setting of educational objectives for programs designed to improve the employment prospects of low-income single mothers.

What has happened to skill requirements in the textile industry? In this industry most jobs are machine operator jobs (lower-skilled) or machine maintenance jobs (higher-skilled). The ratio between the two is changing, from 4.2 operators to one technician in 1975 to 3.5 operators to one technician in 1985. For the operator jobs, technological innovation means that each particular task is easier. However, this narrow conception of skills is misleading; many operator jobs today are more demanding. First, modern looms, winders, open-ended spinning frames, and programmable knitters are much more expensive than the equipment they replaced. Operators must now try to prevent machine stoppages—"down time" is now much more costly. This requires a broader understanding of the production process within which the operator works. It is no longer enough for individuals just to understand the particular task to which they are assigned.

Second, because of the increase in the number of styles produced by each mill, many operators are likely to be engaged in a greater variety of activities and in more of the activities necessary for changing styles. As a result, in addition to a greater emphasis on prevention, some firms are experimenting with broader job definitions and teamwork strategies, and workers in the industry now have less well-defined jobs in a more uncertain environment.

Third, textile firms are also becoming more actively involved with working jointly with clients in developing new styles and fabrics. So far, at least in the firms visited for this project, this strategy does not seem to have had much of an impact on the shop floor, but forward-looking firms are starting to consider how the operators could contribute. The same could be said for ongoing technological innovations. Many of the most important changes have been small adaptations of existing machines, and operators can make important contributions to these efforts.

The higher-level positions in the mills also need greater skills and educational preparation than they did in the past. In the textile industry, the skilled occupations involve machine repair. In the past, textile machines were intricate, but the mechanical principles underlying their construction were not complicated. How these machines operated could be visually observed, and experience that many workers had in their own homes working on automobiles or farm machinery was relevant to fixing them. Loom fixers and mechanics in spinning and knitting mills were almost always promoted from the ranks of machine operators. Working around the machines had already given them a feel for what was necessary, and the additional training needed to become a fixer was acquired on the job with little or no formal instruction.

This situation has changed. Most machines now have microprocessors and other electronic components, as well as sophisticated sensors and yarn splicers

and knotters. This equipment is well beyond the experience that most workers get in homes and on farms. Since important machine components are not visually observable, operating the machines does not provide much of a sense of what it takes to repair and maintain them. In other words, to understand, diagnose, and fix the new machines, technicians have to be able to represent their structures and processes symbolically in their heads. To do this they have to be able to follow complicated manuals, diagrams, and updates provided by the manufacturers. Literacy requirements have accordingly shot up; the mills can no longer fill all of the technician slots from their traditionally semi-literate operator labor pool; and states in which the mills are concentrated, such as the Carolinas, suddenly have mill owners' support for higher quality elementary and secondary education.

In sum: In both the service and manufacturing industries we are moving from a production-oriented to a product-oriented world, from mass production to flexible production. In all of the industries studied, Bailey and Noyelle have found that increased competition, volatility, and uncertainty in the market have created strong pressures on all levels of the production process to be more responsive to changes in tastes and demand. Indeed, it has become increasingly difficult to separate the marketing and product development functions from the production process itself, and this has profoundly disrupted the traditional production technologies.

Although ability to work on new machines is important, many of the most important changes cannot be understood as quantitative. Asking whether the work requires "more" or "less" skill inevitably focuses the analysis on limited and often secondary aspects of the transformation underway. Productivity gains are coming as much from changing the way that workers work together, their orientation toward their work, and the nature of their responsibility and involvement in the firm's changing strategy and orientation toward the market as from applications of new technology. While many jobs used to be based on the repetition of a particular set of well-defined tasks, jobs now are more likely to demand varied and unpredictable responses to a variety of stimuli and information. Employment now involves interaction in constantly changing ways with production technology. The spread of micro-electronics and related technologies does not just result in new machines that must be mastered, but in a much deeper change in the way production is organized and the ways that workers relate to the production process and to each other.

Let's now think about what these industry studies imply for our educational objectives for low-income single mothers. They certainly imply the need for good basic skills — for example, recall the higher literacy requirements for textile mechanics. However, I argue that they also imply the need for higher-

order thinking, even for jobs that we usually conceive of as lower skill. Let's look at the defining characteristics of higher-order thinking for a moment. In a 1987 National Academy Press publication, Lauren Resnick, a cognitive psychologist at the University of Pittsburgh, suggests that:

- Higher-order thinking is nonalgorithmic. That is, the path of action is not fully specified in advance.
- Higher-order thinking tends to be complex. The total path is not "visible" (mentally speaking) from any single vantage point.
- Higher-order thinking often yields multiple solutions, each with costs and benefits, rather than unique solutions.
- Higher-order thinking involves nuanced judgment and interpretation.
- Higher-order thinking involves the application of multiple criteria, which sometimes conflict with one another.
- Higher-order thinking often involves uncertainty. Not everything that bears on the task at hand is known.
- Higher-order thinking involves self-regulation of the thinking process. We do not recognize higher-order thinking in an individual if someone else "calls the plays" at every step.
- Higher-order thinking involves imposing meaning, finding structure in apparent disorder.
- Higher-order thinking is effortful. There is considerable mental work involved in the kinds of elaborations and judgments required. (Resnick, 1987, p. 3)

Let's look again at how work has changed: the need to deal with uncertainty, to understand the firm's market environment, to understand the organizational context in which one's job is embedded, to anticipate, to deal with the unfamiliar and with discontinuity. There is a stunning parallel between these changes in the nature and structure of work and the defining characteristics of higher-order thinking.

As Resnick (1987) and others point out, American education, like that in other industrialized countries, has harbored two quite distinct educational traditions — one concerned with elite education, the other with mass education. These traditions conceived of schooling differently, had different clienteles, and held different goals for their students. In educational institutions aimed at the elite in the population, higher-order thinking skills are nothing new. They represent what might be called the "high literacy" strand in the history of education, as opposed to the "low literacy" tradition underlying mass education and aimed at producing minimal levels of competence in the general population. Resnick notes that "although it is not new to include thinking, problem solving, and reasoning in someone's curriculum, it is new to include it

in everyone's curriculum." (p. 7) I suggest to you that this is precisely the challenge ahead of us – to make thinking and problem solving a regular part of a school program for all of the population, even minorities, even non-English speakers, even the poor, even low-income single mothers – to assume that all individuals, not just an elite, can become competent thinkers. What this implies is that improving basic skills is not a sufficient objective for the educational reform movement or for how we often conceive of literacy programs.

Second Research Strand

The second research strand is pioneering work in cognitive psychology on non-school learning and its implications for how we structure formal learning. At the heart of this work is the presumption that intelligence and expertise are built out of interaction with the environment, not in isolation from it. This work implicitly challenges our traditional distinctions between "head" and "hand," between "academic" and "vocational" education, between "education" and "training," and between school-based and work-based learning.

Workers will need both good basic skills and high-order thinking skills, even for jobs conceived as lower-skilled and especially in the more fluid and fast-paced service and manufacturing industries.

In studies of workers in jobs that vary substantially in their symbolic and physical requirements, Sylvia Scribner, a member of the NCEE research staff, finds a set of interrelated attributes that are common to expert performance in all jobs:

- Flexibility in modes of solution to formally identical problems;
- Creative shortcuts that simplify and economize on mental and physical effort ("least effort" basis for organizing work); and
- Fine tuning to the environment and effective utilization of setting-specific knowledge.

Coming out of this stream of research is a much clearer sense of how school-based learning and non-school learning differ from each other. Lauren Resnick compellingly summarized several of these differences in her presidential address at the American Educational Research Association's April meeting in Washington, D.C. She delineated four broad contrasts between in-school and out-of-school mental activity that raise profound questions about the utility and effectiveness of schooling for all non-school activity, including work of all types and for all learners, whether at-risk or not-at- risk.

The first contrast is between *individual cognition in school versus shared cognition outside.* For the most part, school is designed so that one student's success or failure at a task is independent of what other students do (aside from grading on a curve). By contrast, a great deal of activity outside of school is socially shared: work, personal life, and recreation take place in social systems in which what one person is able to do depends fundamentally on what others do and in which "successful" functioning depends upon the mesh of several

individuals' mental and physical performances.

The second contrast is between *pure mentation in school versus tool manipulation.* In school, the greatest premium is placed on "pure thought" activities — what individuals can do without dependence on "external crutches" — whether books and notes, calculators, or other complex instruments. While some of these tools may be used, even encouraged, during "learning," they are almost always absent during tests of performance. Thus, school becomes an institution valuing thought independent of the physical and cognitive tools that are a vital and defining part of virtually all practical activity. Out of school, by contrast, most mental activities are intimately involved with and shaped by the physical and intellectual tools available, and the criteria for competence include the expert use of tools.

The third contrast is between *symbol manipulation in school versus reasoning about things and situations that make sense to people outside school.* School learning is mostly symbol-based, to such an extent that connections to the things being symbolized are often lost. Outside of school, actions are intimately connected with things and events, and because one is engaged with things and situations that make sense to people, people do not fall into the trap of forgetting what their calculations or their reasoning is about. Their mental activities make sense in terms of their immediate effects, and their actions are grounded in the logic of immediate situations. In school, however, there is a very large tendency for symbolic activities to become detached from any meaningful context. School learning then becomes a matter of learning rules and saying or writing things according to the rules. This focus on symbols detached from their referents can create difficulties even for school learning itself. For example, it can lead to systematic and persistent errors of a kind that seem virtually absent in practical arithmetic.

The fourth contrast is between *generalized learning in school versus situation-specific competencies outside.* In school we aim for general, widely usable skills and theoretical principles. Indeed, the major claim for school-type instruction is, usually, its generality and power of transfer. Yet outside, to be truly skillful, people must develop situation-specific forms of competence. The "packages" of knowledge and skill that schools provide seem unlikely to map directly onto the clusters of knowledge that students will actually use in their work. This seems true even for highly technical knowledge, where schooling is intended to provide direct professional training. Studies of expert radiologists, electronic troubleshooters, and lawyers all reveal a surprising lack of transfer of theoretical principles, processes, or skills learned in school to professional practice. All of this points toward the possibility that very little can be transported directly from school to out-of-school use. Both the structure of the

knowledge used and the social structure of its use may be more fundamentally mismatched than we had previously thought.

At the same time, Resnick makes a telling point consistent with the results of many human capital studies in economics. Situation-specific learning by itself is very limiting. Studies have shown that when the situation is changed from the familiar — for example, by asking bookies in Brazil to accept unusual bets that cannot be constructed from their tables (Carraher and Schliemann, 1985) — unschooled individuals have a great deal of difficulty and may fail entirely. Schooled people do better, although — and this is an important point — they rarely use the supposedly general algorithms that they have been taught in school and instead invent new solutions specifically appropriate to the situation at hand.

Final Research Strand

The final research strand is at-risk learners as rational decision-makers. By at-risk learners I mean those who do not perform well in traditional schools or training programs arranged like traditional schools, either because they are not very good at standard academic subjects or — and this is an exceedingly important "or" — because they do not want to be or do not see the point of being good at them. It is important to note that although at-risk learners come disproportionately from poor families, almost everyone in this audience either has or has had a child of this sort or friends with a child of this sort. No group escapes this problem.

In thinking through how literacy programs can connect better to at-risk learners, I want to start by questioning the frequent assumption that at-risk and not-at-risk populations differ in how they learn most effectively. Although it is an empirical issue, I suspect two things. First, variations in learning performances may attest partly to individual differences in the willingness to tolerate or make some sense out of a school-based or school-like experience that is relatively isolated from non-school experience. And, second, these differences in turn may partly reflect differences between at-risk and not-at-risk learners in their visions of their adult "places" in the world.

I suggest that all individuals develop an image of their niche in the adult world — in the ecological sense of niche. Their ideas about the ecology of adult "places" may be distorted and are usually pitifully and pathetically partial. The research shows, however, that they work out notions of their basic futures and of the trajectories relevant to them, even if they cannot state these explicitly. And they act on these ideas — such as electing into or out of advanced mathematics in high school, depending on their sense of occupational destination.

WHILE PUBLIC PRIMARY- AND SECONDARY-SCHOOL IMPROVEMENTS MAY BE IMPORTANT FOR LONG-RUN REDUCTION IN ADULT LITERACY, THE CONSENSUS AT THE SEMINAR WAS THAT THESE SCHOOLS GENERALLY CANNOT BE EXPECTED TO MEET THE EDUCATIONAL NEEDS OF ADULTS WITH DEFICIENT BASIC SKILLS.

For example, I analyzed data from a national longitudinal survey of youth, concentrating on the fourteen- to seventeen-year-olds in the sample. The purpose was to understand the dynamics that underlie the traditionality of young girls' occupational choices. What drove these girls' occupational preferences were fundamental choices about what kinds of commitments they expected to make as adults. The adult agendas that these girls had for themselves revolved around the basic issue of family versus work. Their commitment to one or the other (or to some balance between them) drove the traditionality of their occupational choices, which in turn drove the future educational investments that they expected to make. We can note that these agendas were fully developed even for the fourteen-year-olds, indicating that their concepts of their futures had to have been forming well before the age of fourteen.

I doubt that these girls knew that many of their future plans simply cascaded from and elaborated a fundamental choice of direction. In other words, I do not think that most of these girls could have cogently described the structure of choices that lay so clearly in the data. Nonetheless, I suggest that the basic behaviors of all individuals, at-risk and not-at-risk, can be interpreted from the perspective of what they can envision for themselves.

For example, I suggest that the girl who becomes the teenage mother, although we hear a great deal about her "wanting someone to love," is more fundamentally taking the action that lets her occupy the niche of "mother," a place in the adult firmament that best fits how she sees her talents and opportunities. (Never mind the destructive potential of that choice that we can see.) From this perspective a decision to keep the baby is essential to implementing her sense of place in the work — and our attempts to contain the damage of teenage pregnancy by trying to persuade her to put the baby up for adoption attests more to our dimness than to hers.

The individual who scrapes by to high school graduation, or who drops out — or behaves so intolerably that he or she is pushed out — may not be able to envision and emotionally claim an adult future that requires the core curriculum of the high school. When schools concentrate on narrow verbal and mathematical-logical skills, though Lord knows that these are important, I suggest that we may inadvertently limit their vision to jobs that are highly academic in content, whereas in fact only a small share of total jobs are of this nature. As Howard Gardner, the Harvard psychologist and author of *Frames of Mind*, noted in an interview with the *New York Times*, "We subject everyone to an education where, if you succeed, you will be best suited to be a college professor" (November 9, 1986, Education Section, *New York Times*, p. 23).

And if a person cannot envision participating in adult jobs that are highly

academic in content, two things happen. First, the individual cannot look to the school or the literacy program for his or her sense of ultimate place and trajectory; he or she must look elsewhere, and the school or the program, in a basic sense, has lost that individual. And second, instruction in academic skills will become "irrelevant" to the person — or, in decision theory terms, without "utility." Decision theory presumes and countless studies show that individuals — children and adults, at-risk and not-at-risk — do things that have utility for them, that connect to what they want and where they expect to be going.

In sum, the contrasts between in-school and out-of-school mental activity that Resnick describes suggest that school-based learning is not particularly related to out-of-school activity for any individual. If school is head, out-of-school is head and hand, mind and environment. However, what we teach in traditional schools and in many basic skill remedial programs and how we teach it seem least relevant to those individuals who lack the ability, or confidence, or desire to engage in concentrated symbol-based activity outside of school, such as the professional occupations. From this perspective, traditional schools and schooling may be creating their own problems in reaching their own learning goals and helping to produce the "at-risk" learner.

Note: The Institute on the Economy and Education of Teachers College at Columbia University conducts research primarily within the context of two research centers: the National Center on Education and Employment (NCEE), funded by the Office of Educational Research and Improvement (OERI) of the U.S. Department of Education under Grant No. G008690008, and the National Center for Research on Vocational Education, funded by the Office of Vocational and Adult Education of the U.S. Department of Education.

Literacy Skills Needed in the Workforce

Raymond Uhalde

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After recognizing the knowledge and experience of the audience and my fellow presenters, preparing these remarks was a real struggle! What could I contribute to such a group of experts, without "preaching to the choir"? I thought about it for a long time. I thought back to a literacy conference we had last fall, jointly chaired by Karl Haigler, director of adult education at the Department of Education, and Roberts T. Jones, now acting assistant secretary for the Employment and Training Administration. At that time, the public and private sector representatives were asked what they thought government could best do to contribute to adult education and increased literacy. They suggested that we in government could best evaluate promising approaches and disseminate best ideas and practices. Well, to a large extent that is what we are doing, and what I would like to contribute to our conversation today.

We want to implement theories that you develop. We can provide the bridge between the theories and the practices. We have begun a serious research, pilot and demonstration, and evaluation program aimed at finding ways to apply the latest advances in literacy and learning to practical problems we need to address within job training systems and on the workshop floor. Our efforts range from evaluating technology-based instruction techniques through the gamut of literacy programs for special targeted groups such as teenagers and dropouts, women on welfare, displaced homemakers, and displaced workers of all ages.

We began last year by contracting with the American Society for Training and Development to research best practices in employee training being undertaken in the businesses. Some of you are aware of their efforts to develop a "how-to" basic skills manual for employers to use. We also initiated a number of demonstration projects testing the use of interactive video-disk technology in the workplace. New courses are being developed in cooperation with business and organized labor, predominantly in business-related mathematics. As part of this year's efforts, the Hudson Institute will continue the overall Workforce

2000 research and policy development and will also focus directly on literacy issues. We will solicit a number of grants and contracts intended to provide us with greater knowledge about how people learn and the best ways to teach them. I will direct my remarks to three or four of our more important efforts.

As you know, arguments have been made that technology advances will both increase and decrease the level of job difficulty. Both sides are right, but the de-skilled jobs probably will not pay a living wage, and the more demanding jobs may require skills that many don't have. Competition for those who are skilled will be fierce. Unless we can bring up the literacy levels of our workforce, standards will be lowered as it becomes more difficult to fill jobs at the levels required. Even now, many prime-aged workers are being displaced as jobs are either abolished, eroded of content, or restructured significantly. There is no emergency in finding qualified workers yet, but the future is dimmer; employers will have to reach deeper into the queue as the supply of young workers decreases. Just how much of a problem do we have? What is the impact for future training needs?

Research by the Hudson Institute projects a growing mismatch between the skills of the youth population and the literacy requirements for jobs in the future, with a significant proportion of young adults possessing lower literacy skills than required for employment.

According to Arnold Packer, a Hudson Institute researcher, the problem is large, and the impact on training needs is significant. Packer set up a comparison between young people's skills based on the National Assessment of Educational Progress (NAEP) data for prose, document and quantitative literacy levels with measurements of the language, math, and reasoning skills required for jobs listed in the *Dictionary of Occupational Titles* (DOT). You are all familiar with the NAEP data, but may not be aware of the Department of Labor's (DOL's) literacy measurements.

DOL's Occupational Analysis surveyors use the General Educational Development (GED) scale, which rates math, language, and reasoning requirements of all the jobs listed in the DOT on a scale from 1 to 6. A score of 1 would be assigned to a helper or laborer job. It would indicate the ability to print simple sentences using a vocabulary of 2,500 two- and three-syllable words, and the ability to compare series of numbers or words. A score of 2 would indicate the ability to read adventure stories in comic books, a larger vocabulary, the ability to punctuate and use complex sentences properly and to speak clearly and distinctly. At level 3 the job would require that a person be able to speak with poise before an audience, write reports and essays in proper format, and be able to read safety rules and instructions. Level 4 job requirements include the ability to read journals and manuals, participation in panel discussions and debates, and to prepare business letters, summaries, and reports. The highest levels — 5 and 6 — include occupations such as law and medicine, require the writing of manuals, journals, critiques, and the mastery of effective, persuasive speaking.

Only 2 percent of the net job growth of 26 million between 1984 and the turn of the century are projected by Hudson to require language skills below a level of 2.5 on the GED scale. There will actually be a reduction of 400,000 jobs requiring less than level 2. The largest increase of 58 percent (15 million) will be in jobs that require levels between 2.5 and 3.9. These are marketing, sales, administrative services, supervisory, and similar jobs. There will also be a significant increase in higher-level jobs at or above level 4. These professional or technical jobs will increase by 40 percent (10 million). DOL projections of these occupational areas that will experience the largest growth include service workers, energy technicians, industrial processing, and industrial robot production.

Packer looked at these data sources to estimate the extent that the supply of workers would match the job demands. Assuming no change in the quality of education, he used the NAEP scores as a benchmark for the abilities of the labor force. The relationship between the NAEP and DOL scales was not straightforward because differing concepts were measured. In particular, the math scales had to be dropped entirely since the DOL scale measured math operations, while NAEP measured the ability to perform word problems. However, there was a fairly good relationship between the GED language scale and NAEP's document and prose literacy scales.

His results should cause us grave concern. Twenty-six million people will need to increase their literacy levels, on average, the equivalent of 1.0 on the GED scale from an existing level of 2.6 to a required level of 3.6. Only 9 percent of the NAEP-surveyed young adults possessed language skills of 3 or better, while 40 percent of the projected net job growth will require levels of 4 or better. We have a very serious competitiveness problem if our jobs must be filled with those who are poorly qualified to perform them, to say nothing about the impact on the future incomes of the low-literate workers themselves. We also face a serious challenge and opportunity to change this situation.

We need to help both youth and adults achieve better literacy skills. To help youth, we need to reach them at a very young age. Studies have shown that the best dropout prevention is sound early childhood education. For kids who missed out on that, we can intervene to keep them in school and improve their chances at getting a good job. We have a number of legislative, research, and demonstration efforts underway to reach youth who are at risk of failing and those who have already dropped out of the education system. The Council of Chief State School Officers (CCSSO) is addressing the issue of at-risk children and youth, on a state level. The CCSSO is awarding state action grants for the purposes of promoting, planning, and implementing activities that seek the adoption of policy and state legislation guaranteeing the educational and

related needs of children and youth identified as at-risk. The Summer Training and Education Program (STEP) focuses on in-school youth by providing basic skills remediation, and work and education experience during the summer months to prevent dropouts and teenage pregnancy. For those youth who have left the system, the JOBSTART project provides intensive remediation in job training and basic skills to dropout youth who read below the 8th-grade level. Job Corps is formally evaluating the effectiveness of computer-assisted instruction on learning gains for youth between the ages of 17 and 21 who are normally dropouts.

Within the Job Training Partnership Act (JTPA), we have proposed a new youth performance measure which focuses on increasing the long-term employability of youth through the attainment of youth employment competencies. DOL has grouped employment competencies into three areas: 1) pre-employment and work maturity skills; 2) basic education skills; and 3) job specific skills. In order to obtain credit for a competency attainment, youth will have to successfully complete two of these areas. The youth employment competency system must include learning objectives, related curricula, pre- and post-assessment of educational and employment competencies, individual employability development plans, and written certification that the individual has successfully completed the education and training requirements. We are also proposing that all JTPA participants be assessed as to their reading ability.

TO THE EXTENT THAT LITERACY IS TO BE TAUGHT IN A FUNCTIONAL (I.E., JOB) CONTEXT, PROGRAMS WILL NEED TO BE CONSTANTLY CHANGING TO MEET LOCAL LABOR MARKET NEEDS.

For reaching and helping adults on a large scale, the workplace is a particularly appropriate setting. That's where the people are, and that's where literacy problems show up. The workplace is also where the motivation to learn is the strongest; there is the direct connection with a paycheck.

The workplace is an ideal setting for training, since people have worked out ways of getting there, and for attending to home concerns while they are there. Schools frequently are too inconvenient. Adults who try to attend night classes to improve their skills are frequently frustrated in that attempt. They, particularly the women, have little time, energy, and resources left after a full day of work and family necessities of managing a home, preparing meals, and spending time with their children, to get in a car or bus and run off to night classes.

We see as our challenge finding ways and encouraging employers to incorporate literacy improvement into the workplace. In addition to finding both the adults and the problems there, the workplace is a good setting for teaching literacy in the immediate context of the job. As Thomas Sticht, Larry Mikulecky, and others have shown, literacy skills can be learned far more rapidly when they are taught as part of the processes of teaching job skills. We are still uncertain, however, about how generically to define the "job" — how

broadly so as to be at once effective, efficient, and transferable to other work settings. This needs more research. A side benefit of functional context instruction is that there is no stigma attached to learning job skills as there can be in learning "literacy" skills. Thus, the dignity of the adult learner is safeguarded.

Requiring higher-order thinking skills for career mobility is not new among employers, but employers increasingly seek these skills for entry-level positions as well.

Many employers have already begun to invest heavily in the training of their existing workers. While bitterly complaining about the failure of the school systems to prepare their workforce, they have reached the conclusion that it is now their problem, and have set about trying to fix it. Organized labor, too, is getting involved; they see the lack of flexibility and job skills eroding their members' job security. Firms with new flatter management designs that seek to hire and promote from within are facing up to training needs as well. On the whole, however, the smaller firms are finding training to be difficult and costly. Yet, they have the greater proportion of new job growth.

We are also beginning one initiative in our own JTPA system. We are planning to enter into a grant with the Educational Testing Service (ETS) to expand upon the work already done with the young adult literacy survey. ETS will develop and validate additional literacy items for the survey instrument while surveying the literacy levels of our JTPA, Employment Service, and Unemployment Insurance clients. They will oversample those 21 to 25 years old to permit an accurate comparison between the ETS sample and the NAEP sample. This will provide us with needed information about the literacy levels of our clients and provide the groundwork for phase 11 of this study.

In this phase, an expanded number of survey items will be developed into individual assessment instruments. The results of these assessments on individual clients will provide the information needed to better tailor training to their individual needs and to the needs of employers.

For JTPA and the larger employment, training. and business community, we also want to research new teaching technologies that are suitable for contextual learning on or at the worksite, contribute to immediate and rapid learning, with an immediate impact on job improvement, with little or no disruption on operations, and at affordable costs for large and small alike. Certainly, this is a large task.

We have initiated work on this in part through a grant to the American Society for Training and Development (ASTD), which will examine actual workplace training practices that are creative and are capable of being transferred to other public and private employment systems. The emphasis will be on producing training tools that are useful. Six areas will be examined:

- How training can be integrated into the strategic goal of the institution, and how training can be financed and managed;

- How managers can use training to adapt to change and increase productivity;
- How training is accounted for;
- What the impact of training is and how it contributes to increased productivity;
- How employers provide technical training with a focus on training for critical occupations; and
- Why basic skills are important for entry-level workers and for experienced employees attempting to adapt to technological change; and how employers can provide basic skills instruction for their workers.

The findings will be published as a series of reports and how-to manuals for the basic skills and accounting systems.

ASTD research will most likely reconfirm the finding that "academic" literacy training alone is not sufficient to meet the needs of the workplace. The Committee for Economic Development, after surveying 1,200 companies, identified the following attributes as the most important for success as an entry-level worker:

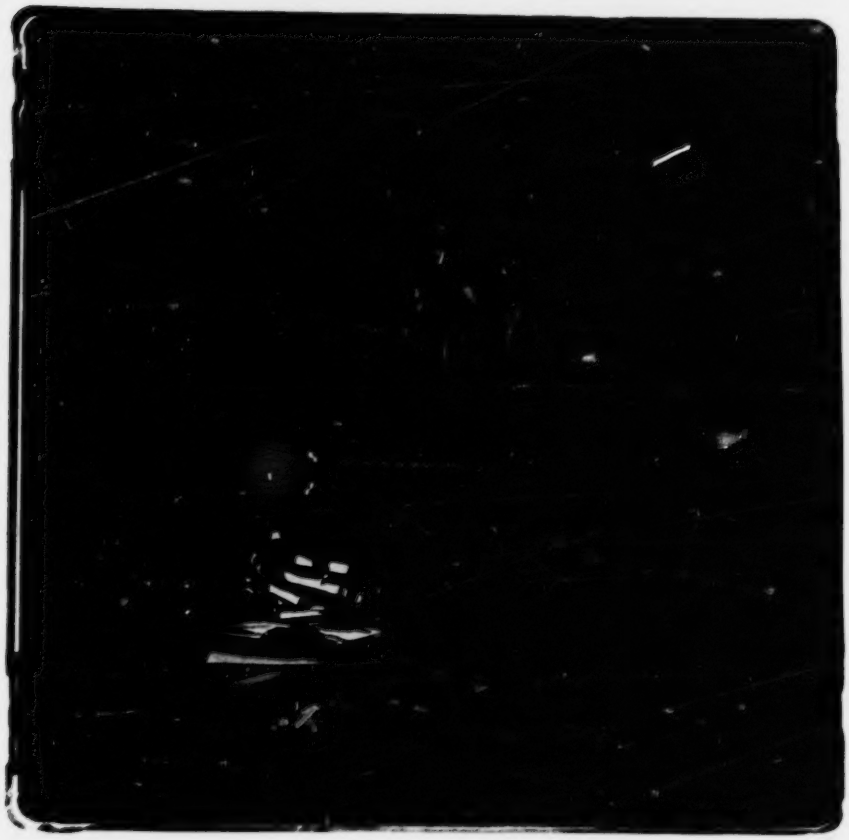
- Communicating clearly and effectively, both orally and in writing;
- The ability to work cooperatively in a group setting;
- Problem-solving and decision-making;
- Personal reliability (motivation, ethics, etc.);
- Individual competence; and
- Priority setting.

Recent news articles about Toyota hiring practices for its new Kentucky plant indicate that all these literacy and attitudinal attributes are being rigorously sought in their new workforce hiring practices. Administering 14-hour test batteries for English and math literacy, three interviews, problem solving, and trouble shooting tests for assembly line workers is extremely different from what American job applicants have come to expect. However, given our advancing job skill needs, this could well become a trend (in more modified form) in the near future.

Because we clearly recognize the multifaceted nature of the workplace literacy problem, we have also established partnerships with other federal agencies, such as the Departments of Education, Defense, and Health and Human Services. For example, the Departments of Education, Defense, and Labor are embarking on an interagency initiative to transfer military-developed tools and technology to civilian uses in addressing job and literacy skills deficiencies. JSEP, the Job Skills Education Program, is designed to diagnose deficiencies and provide computer-assisted training for improving basic education and analytic skills related to specific occupations.

As all of you know, addressing the needs of our workforce requires the mutual commitment of organizations and agencies such as education, human services, business, labor, etc. It is our hope that labor's contributions, in addition to the efforts of education, business, social services, etc., will aid in successfully meeting the challenge of preparing our workforce for the year 2000 and beyond.

LITERACY SKILLS MEASUREMENT AND PROGRAM EVALUATION



Assessing Literacy Skills and Gains in Job-Oriented Literacy Training Programs

Thomas G. Sticht

In work by R & D teams that I directed to develop job-oriented literacy programs for the U.S. Army, we found that:

1 There was an ongoing literacy program that was based on a "General Educational Development (GED)" model of adult education, in which adult literacy development is conceived as recapitulating for the adults the academic experiences of the public schools, and hence program pre- and post-testing for assessing growth was accomplished using standardized tests normed on grade-school children with reading scores stated in reading grade levels (RGLs);

2 The programs were offered prior to a person's entry into some form of technical training and, despite the grade-school, Office-of-Education orientation of the programs, their major operational effect was intended to improve the ability of personnel to read, comprehend, and use their job technical training and job performance manuals and other job aids but no assessment was conducted to see if the gains in RGLs reflected gains in job-related reading ability; and

3 When job reading task tests, constructed from reading materials people reported using in technical training and job performance, were administered to students undergoing academic literacy training, little or no improvement was found with programs ranging from 30 to 390 hours in duration, suggesting very little transfer or generalization from the academic-oriented reading measured by the grade-school referenced tests to the performance of job reading tasks.

Based on findings such as these, it seemed more reasonable to expect job-related literacy to improve if the literacy training was based on the materials and tasks that people encountered in technical training and job performance. For this reason, research was conducted that demonstrated that literacy training incorporating job-related materials and tasks produced 1) as much or about as

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much improvement in academic, or "general," literacy as is typically made in academic, GED-oriented programs; and 2) gain in job-related reading that was two to three times the gain made in academic literacy, and well beyond the improvements made in job-related reading by comparison with literacy programs of an academic nature (Sticht, Armstrong, Hickey, and Caylor, chapter 9).

In developing job-related literacy programs for the U.S. Army and Air Force, we followed the practice of using the same grade-school normed, standardized reading tests that were being used by the "conventional" program that the job-related program was designed to replace, as a pre- and post-test measure. That permitted us to see how well the job-related program performed in improving general literacy skills in comparison to the conventional program.

Additionally, however, we developed job-related reading task tests composed of samples of job reading tasks performed by trainees and job performers. These tests permitted us to find out how well the literacy students in both the job-related and academic-related programs improved in their ability to perform job reading tasks.

Traditional standardized tests can be replaced by job-related reading tests. People who did well on the job-related literacy measures also did well on the general literacy measure.

Job-Related Reading Task Tests (JRTT)

For the U.S. Army, the job-related reading task tests (JRTTs) were scaled in terms of RGLs because Army management preferred to think in terms of grade levels of improvement. This scaling was accomplished by administering the grade-school referenced, general reading tests to several hundred Army personnel. These same personnel were administered the three forms of the JRTTs. Then, based on the correlations among the general reading tests and JRTTs, tables were developed for converting JRTT raw scores into estimated RGLs on the general literacy tests. Thus it was possible to express improvement in both general literacy and job-related literacy in terms of gains in RGLs.

In general, then, it is possible to develop job-related reading task tests to measure improvement from pre- to post-testing, and to express this improvement in RGLs if accountability requirements demand RGLs. For instance, one could develop a job-related reading task test (JRTT) for an electronics technician's (ET's) training and job performance, and then scale the JRTT in terms of reading grade levels on the Test of Adult Basic Education (TABE), Adult Basic Learning Examination (ABLE), etc. If a literacy program has been developed that incorporates materials and tasks from the ET's technical training program, then one would predict that gain on the ET's JRTT would be greater than gain on the TABE or ABLE or other test of general literacy.

It might also be expected that performance on the ET's JRTT would be a better predictor of subsequent success in the ET technical program (assuming a sequence of instruction in which students first take the literacy program to

qualify for entry into the ET program). This would have to be empirically determined in a predictive validity study. Ideally, this would involve testing a number of people who wished to go into electronics training, letting them all enter training regardless of their test scores, and then determining who could or could not perform satisfactorily in the technical training program. With this information, a decision could be made regarding the criterion score on the JRTT below which students would be assigned to first attend the job-related literacy program. Further study would then need to be done to establish how well literacy students who met the criterion and subsequently entered technical training performed, and whether an adjustment to the criterion score was needed. This is a time-consuming and expensive approach. Less costly, but also with less certainty, are methods using readability formulas or teacher judgments to set criterion entry scores on the JRTT. Validating the latter would, eventually, require essentially the same data as does the predictive validity approach.

Uses of Assessment

The foregoing discussion reveals two uses of assessment in literacy programs. First, assessment is used to determine who needs to go into the literacy program and, later on, to determine if criterion levels of literacy are achieved.

Second, assessment is used for accountability purposes. Pre- and post-test scores are used to indicate whether or not the program is bringing about improvement in literacy skills, and whether the amount of improvement is comparable to, less than, or greater than that made by other programs having similar objectives. Standardized tests, rather than or in addition to other, locally used assessment procedures, such as work samples, are especially useful for comparing one program's achievement to another's.

A third use of assessment in literacy programs that reflect the academic, GED model, in which literacy lessons are arranged in terms of grade levels or other codes for difficulty, such as Levels A, B, or C, etc., is for placement at the appropriate instructional level. In the job-related reading programs we developed for the U.S. Army and Air Force, no hierarchy of difficulty level sequence of instructional materials was developed. Rather, in one strand of instruction, all students took pre-module tests and could pass their way through a curriculum that taught the reading and use of actual job-related materials module-by-module. Thus, module tests, not the pre- and post-tests used for summative evaluation, determined whether or not a student received instruction in a given module. In the modules, instruction went from simple to complex and from a focus on the structure of textual material (e.g., the headings and subheadings on a page) to the content of the material.

In a second strand of instruction, attention was on performing team tasks, so all students performed the same tasks regardless of the difficulty of the task. Because the literacy tasks were job-related, all students learned job-related concepts that they would use in their follow-on technical training. Because there was limited time allotted for literacy training, not to exceed six weeks, no attempt was made to present a hierarchy of difficulty, though job-related materials were developed that were below the difficulty level of the materials the students would encounter in their technical training.

Three Levels of "Generality" of Tests

The three types of uses of assessment were applied in the military R & D projects using three types of tests. The most general test was the grade-school normed, standardized test of "general" literacy. This told us about how much improvement in "general" literacy took place in the job-related literacy programs, and how these job-oriented programs compared to academic-oriented programs in improving "general" literacy.

The second type of test used in the military programs were the Job-Related Reading Task Tests (JRTTs) that were scaled to be interpreted in RGLs. These JRTTs were not based strictly on one military job. Rather, the Army JRTTs sampled the six job-related reading curricula developed for the U.S. Army (clerical, combat, communications, cook, medical corpsman, automobile mechanic) and the Air Force JRTTs sampled the two curricula developed for the Air Force (administrative and mechanical). Thus, the JRTTs did not reflect simply what was taught in a given job-related reading program. Rather, they indicated more general improvement in reading job-type materials. While more closely related to the job-oriented reading curricula than the "general" literacy tests, the JRTTs were not tightly coupled to a specific curriculum.

The third type of tests used in the military programs were pre- and post-tests for well-defined modules of instruction within each of the six Army job-related curricula and the two Air Force curricula. Hence, the module tests were tightly coupled to specific instruction and, therefore, were the most sensitive to specific improvements in learning.

With these three types of tests we were able to discern improvements in the learning of specific job reading skills (module tests), improvements in reading and performing a broader range of job-related reading tasks (JRTTs), and improvements in academic-oriented, "general" literacy materials (grade school, norm-referenced, standardized reading tests).

Experimental Functional Skills Program (XFSP) Reading Assessment System

The work for the U.S. Army and Air Force was completed in the early 1970s. More recently (1983–86), in R & D for the Navy, we developed a reading program of 45 hours' duration that is offered on duty time to Navy enlisted personnel. The program is aimed at improving reading skills of personnel who read between the 6th- to 10th-grade levels and must read the series of manuals required for preparing for career progression exams. These are personnel who generally have more than a year of active duty, and so they have a fair amount of knowledge about the Navy. Furthermore, because the career progression exams are the same for all Navy personnel, they are not strictly job-related. Rather, they aim to prepare people for supervisory and junior management roles within their job fields. Thus, the manuals provide reading that all Navy personnel must perform to get promoted.

In this work, we developed a different kind of Navy-related reading system. We called it a system because it is more than just two forms of tests for pre- and post-testing. Instead, it is a system that makes it possible to configure many different forms of tests without having to re-norm tests, as is the case with traditional standardized, normed tests. Additionally, it permits the generalization from Navy-related tests to adult literacy tests developed by the California Adult Student Assessment System (CASAS — now called the Comprehensive Adult Student Assessment System because states other than California have adopted the system).

Traditional tests are grade-school oriented, with contents and tasks like those found in the elementary and secondary schools, while the XFSP system is Navy career progression-oriented, with contents and tasks derived from Navy promotion manuals. Additionally, the traditional tests are normed on children, while the XFSP system is normed on adults (Navy personnel and CASAS examinees).

The traditional tests, because they are designed to be used nationwide, cannot reflect any particular curriculum. Furthermore, the K-12 system does not include specific reading instruction at the 6th, 7th, etc. grades. In effect, then, standardized, academic-oriented tests at this level are based on no curriculum. In contrast, the XFSP system is based on a specific, Navy-oriented curriculum.

Significantly, traditional tests are based on a reading grade level scale and traditional scaling and norming procedures which require that newly developed tests undergo new norming, and which permit no explicitly stated generalizability beyond the tests to the performance of reading tasks not on the tests themselves. In contrast, the XFSP system uses Item Response Theory (IRT; in

this case the Rasch or single parameter model) to scale test items. This makes it possible to configure new, equivalent forms of tests with known difficulty indexes, without re-norming the new tests. Additionally and importantly, it is possible to state with some precision the probability that a student can perform items not included on the tests but previously scaled on the same IRT model scale.

In the present case, the Navy items were placed on the same scale as the CASAS items, which makes it possible to indicate the probability that a person receiving a certain XFSP reading test score could perform any of several thousand items in the CASAS item bank. Thus, unlike the traditional standardized, grade-school normed test, it is possible to generalize from the Navy-oriented tests to a specified domain of adult reading, that defined by the CASAS domain of items scaled on adults.

Another literacy test developed for the Navy measures a person's background knowledge. The test measures what a person already knows about the work for which he or she will be trained.

Finally, traditional reading tests assume that reading is a content-free skill, and so no attempt is made to measure knowledge per se (though vocabulary knowledge may be assessed, but usually under the guise of vocabulary skill, and with no good basis stated for why vocabulary knowledge should increase. This is a particularly vexing problem when it is realized that if one teaches the vocabulary words that are on a test directly, then that is called "teaching to the test" and is considered as "cheating"!).

The Navy tests, on the other hand, explicitly recognize that knowledge is necessary for improving reading comprehension. Hence the Navy test battery includes a measure of Navy knowledge and its growth in the reading course. Additionally, the Navy battery measures improvements in two broad categories of skills that were found in earlier research to characterize much of what work-oriented and training-oriented reading consists: reading-to-do something and reading-to-learn from documents. In reading-to-do, which makes up the bulk of job-related reading, a person is performing a job task, needs information, looks up the information in a document, applies it, and can then forget it. In reading-to-learn, the person must store the knowledge obtained from the document, usually a book or manual when in a schooling or training situation, in some form in his or her long-term memory or knowledge base.

In the Navy test, it is possible to compare a person's performance on the knowledge test, when questions must be answered from one's own store of knowledge, to his or her performance in answering questions when it is possible to read a passage that contains the needed information. This makes it possible to determine how well a person can increment her or his store of knowledge about a topic or task using external memory stores (documents, books, manuals) over what she or he already contains in the store of knowledge internally, "in their heads."

The Navy's XFSP reading test illustrates an attempt to go beyond traditional approaches to the measurement of adult literacy. It focuses on new, more powerful psychometric procedures (Item Response Theory); new understandings from the cognitive sciences regarding the role of domain knowledge in literacy; new understandings of the information processing involved in reading-to-do and reading-to-learn in both work settings and training programs; and the new Comprehensive Adult Student Assessment System (CASAS) (see additional discussion of the Navy reading program in Sticht, Armstrong, Hickey, and Caylor, pp. 128-132).

Summary and Comment

In this paper I have described personal experiences I have had in the assessment of literacy in work-oriented programs. I have indicated the uses colleagues and I have made of tests specially designed to indicate if what is being taught is being learned, and for generalizing beyond the specific program context.

I recognize that not all adult literacy programs work within the contexts that I have described here, and so much of (and perhaps all of) this discussion will be irrelevant to the particular needs of particular programs. I believe that the assessment of adult literacy, and, more broadly, adult cognitive development is a fruitful field for further work, and I look forward to the productive efforts of the Rockefeller Foundation and Wider Opportunities for Women in this endeavor.

Toward a Model of Alternative Assessment

Richard Sterling

Richard Sterling is director of the Institute for Literacy Studies, Lehman College, City University of New York.

The Institute for Literacy Studies at Lehman College operates an adult literacy program, the Adult Learning Center, which is funded by the city and serves approximately 400 adults in the community. The program is required to test the grade-level progress of students after every 100 hours of instruction. Although we have complied with this requirement, we have become convinced that the data produced from such testing serve only to perpetuate myths about the relationship between standardized testing and individual student progress. If we are to understand the degree to which progress is made by participants, we must examine it within the context of their own goals and intentions, and through this examination learn how we can best follow that progress.

In this paper I would like to set out the history and development of our interest in literacy assessment, which began with the work that Michael Holzman, Marcie Wolfe, and I conducted in the Minority Female Single Parent (MFSP) program and which now centers on a research and staff development project in assessment directed by Marcie Wolfe in our own Adult Learning Center. The development of these new assessment procedures was largely informed by the literacy project we conducted with the Center for Employment Training (CET) in 1986. That program, funded by the Rockefeller Foundation, allowed us over a four-week period to conduct two days of training a week in literacy teaching for some 200 instructors. It was designed to assist them in the design and integration of literacy-related activities into their technical training program. We believed that by encouraging teachers to introduce literacy tasks into employment skills training, capitalizing on a setting in which a variety of integrated services were already offered, we would promote a view of literacy as important to the various roles participants assume in their lives — in this case as parents, community members, and workers.

There were some successes in this experiment, specifically in raising teachers' consciousness about the role of literacy in their own and in their

students' lives. We were also successful in promoting experimentation with literacy activities either central or peripheral to the specific job training, but useful as well beyond that training; some of these activities became common features of the programs. The external evaluation of this staff training program focused solely on our impact on the CET staff. While we found the information about teachers useful in evaluating our staff development model, we were not able to adequately assess the impact of our work on the students of the teachers we worked with. The evaluation, which in part counted pre- and post-numbers of literacy events observable in classrooms, raised questions for us about how we might better define literate behaviors and encourage and document their development.

In the work with our own program, the Adult Learning Center, we built on the philosophy of the Foundation's Minority Female Single Parent program. The stated goals of the MFSP program are to "improve the well-being of the participating mothers and their families [and, more broadly] . . . to evaluate how well the overall strategy works, what elements are most (and least) responsible for its success, and how successful programs can be replicated cost-effectively" (Mathematica Policy Research, Inc., 1988). In effect, we began to work with the first part of the MFSP statement as our own goal, believing that if procedures violated the precept of "well being" for students in our own Adult Learning Center, we would not conduct them, and that if the first goal were achieved, then "how well" the program worked, and "what elements" were most responsible for that success, and what should be replicated would be easier to document.

An assessment evaluation process for adult literacy students that is being piloted in the Adult Education program at Lehman College replaces standardized tests with a process evaluation.

We also began to look for clues as to the progress that students made over long periods of time. In Gordon Berlin and Joanne Duhl's 1984 evaluation of "Second Chance Programs," they make the following comment about Head Start:

> Perhaps the most important finding is that Head Start has grown more effective over time. The program's impact on children's cognitive and language development was twice as great after 1970 as in the start-up years 1965–69. These findings hold up despite the enormous variability from program to program in quality and content. . . . Despite early pessimism, twelve years after the program began, a series of longitudinal studies found that Head Start children were less likely to be in special education classes and more likely to be in the correct grade for their age than control children (Berlin and Duhl, 1984).

These findings are important to our programs because, in general, funding sources pressure programs for quick results. Agencies are seldom interested in funding researchers to collect and analyze longitudinal data. The demand for quick results, of course, reduces the circumstances and context for the evaluation to the smallest number of variables. Often the first variables to be elimi-

nated, because they present great difficulty in the formulation of the evaluation plan, are the conditions and circumstances that play a vital role in the changes in people's lives that we seek to document. So when we established our own adult literacy program at Lehman College, we began to think about assessment primarily and most importantly as a service provided to the participants and instructors in the program, rather than as a vehicle for funders to monitor our success according to abstract, generalized standards.

As reading researcher Peter Johnston says, "Most current explanations of reading difficulties focus on the level of operations, devoid of context, goals, motives or history" (Johnston, 1985). Indeed, the steady, lasting progress in students' abilities that is often observed by teachers is denied by test results again and again. New approaches to the assessment of this progress must therefore be developed. We are confident that our efforts at "alternative assessment" will allow us to document this elusive data and that it will prove of value.

An open interview with staff members attempts to measure the abilities students have when they enter the program. Participants are asked to record some of their accomplishments in writing and to select a document they are familiar with to read.

At the Adult Learning Center we are currently experimenting with new assessment procedures which we hope will capture more fully the progress students make. For simplicity I will divide the experiences of the entering program participant into three parts, and I will suggest some possible activities for assessment. I would like to mention here that we are indebted to Susan Lytle from the University of Pennsylvania's Literacy Research Center for helping us to define these categories (for more information see Lytle, 1986).

Beginning Assessment

Defining and establishing the abilities of students who enter programs is difficult, but it is essential both to the teachers and to the students themselves. The whole notion of "ability levels" as defined by tests is conceptually inadequate, and often inaccurate or damaging to the beginning student. It is estimated that some programs lose between 25 and 35 percent of their students as a result of student anxiety about taking diagnostic tests intended to gauge their reading levels. Another way to begin the initial contact with applicants, which has already been put into effect, is for staff to develop a simple sketch of an individual's life in a kind of ethnographic portrait. In our program we have developed what we call Open Houses. Teachers, administrators, and students currently in the program conduct an orientation for new applicants, describing the various activities. Then, in a kind of interview, they talk at length with the applicants about their lives, encouraging them to make a mental inventory of their accomplishments, suggesting ways in which those accomplishments may be useful in the context of the program, and asking them to record and demonstrate some of this knowledge in writing. Students are also asked to select and read, from materials we provide, one piece that seems to be familiar, either in

subject matter, genre, or style. What we are interested in observing is not only the students' ability to comprehend the text, but also the strategies they use to approach the task. Generally, tests do not document the range and variety of strategies used. Rather, they focus on the students' deficits by testing solely for pre-determined responses. Thus, what we hope to establish in our approach is the principle that individuals approach and respond to texts with great range and complexity far beyond the reductive "right answers" designed for them by test makers.

The Open House orientation process is essentially a paradigm for the program itself. Learning takes place in a community in which all participants have roles; helping one another is central in that community; all participants have expertise and abilities that are of use to themselves and others; and an explicit relationship exists between assessment and curriculum. In an employment-training program a procedure like this might also include an interview and inventory of a participant's work history and the skills acquired in doing that work, and a family history with parenting skills and abilities noted. Reading selections might include work-related topics familiar to applicants. It might be useful in addition to ask participants questions that begin the process of meta-cognitive awareness of how to apply strategies to specific literacy tasks. Questions might include:

- What do you do when you need to read something which you find difficult?
- What are your chief reasons for wanting to improve your ability to read and write?
- What other changes do you desire in your life which you believe the program will help you to accomplish?
- What do you currently use reading and writing for?

Ongoing Assessment

The task of ongoing assessment must, we believe, be coordinated by teachers in collaboration with the participants in the programs. Building on the successful experience of the teacher-researcher movement in schools, we are developing, together with Susan Lytle of the Adult Literacy Research Center at the University of Pennsylvania, a training program for teachers to develop participatory research procedures. Teachers will design projects that will record how participants acquire strategies, connect previous knowledge with new knowledge, and apply their knowledge in various settings. The overall goal of these procedures will be to improve instruction and services to participants. We envision that many of these projects will evolve around individual student evaluation, shifting the assessment emphasis from what Johnston calls "test centered evaluation

procedures cast[ing] teacher and learner in fundamentally adversarial roles which preclude effective teaching" (Johnston, 1987) to what Graves has called a process-oriented evaluation requiring the teacher to adopt the role of the advocate (Graves, 1983).

For ongoing assessment, teacher-researchers might document responses to such questions as:

- At what moment do students decide to help other students?
- What types of help do students provide for each other in their reading and writing?
- How do students assess each other and themselves?
- How do students describe their learning?
- How do students describe the strategies they apply to reading and writing activities?
- How do these strategies change over time?

Such inquiry will document "informal" student learning, which teachers often observe but which goes unreported.

Exit Assessment

It is in the area of exit criteria that most programs come face-to-face with demands for traditional quantitative data. In order for program participants to proceed to other kinds of training, to acquire jobs, or to receive benefits, they are often asked to demonstrate reading level achievements, GED certificates, or similar test results to these other groups. What we must do, if we wish to change the way these groups understand and use test results, is to demonstrate to their satisfaction that the students have made important progress, and that additional progress will be visible over time.

An additional issue is the role of the students in the process of assessment. It is important that as adult students work their way through programs, they have an increasing role in determining their own definitions of success, and that the ongoing services be modified according to those definitions. Many of these subsequent services may best be provided by resources in the community, by other members of the participants' new peer group, or in the new employment situation. This kind of assessment should also take note of the participants' changes in attitudes, use of strategies, and changing perceptions of class and gender. These changes involve the collaboration of the researchers with the participants themselves, not just as subjects but, for those interested and willing, as individuals interested in gaining more insight in and control over their environment. We believe that collaboration of this kind will result in important changes in the lives of participants. For women in programs such as the MFSP, this would include changes in their roles, in their perception of themselves and

of the men and women in their lives, in the ways they spend their time both at work and at leisure, and in the ways they respond to their children – all these are possible within the framework of a powerful understanding of their abilities and potential. Some questions that might be addressed in this context are:

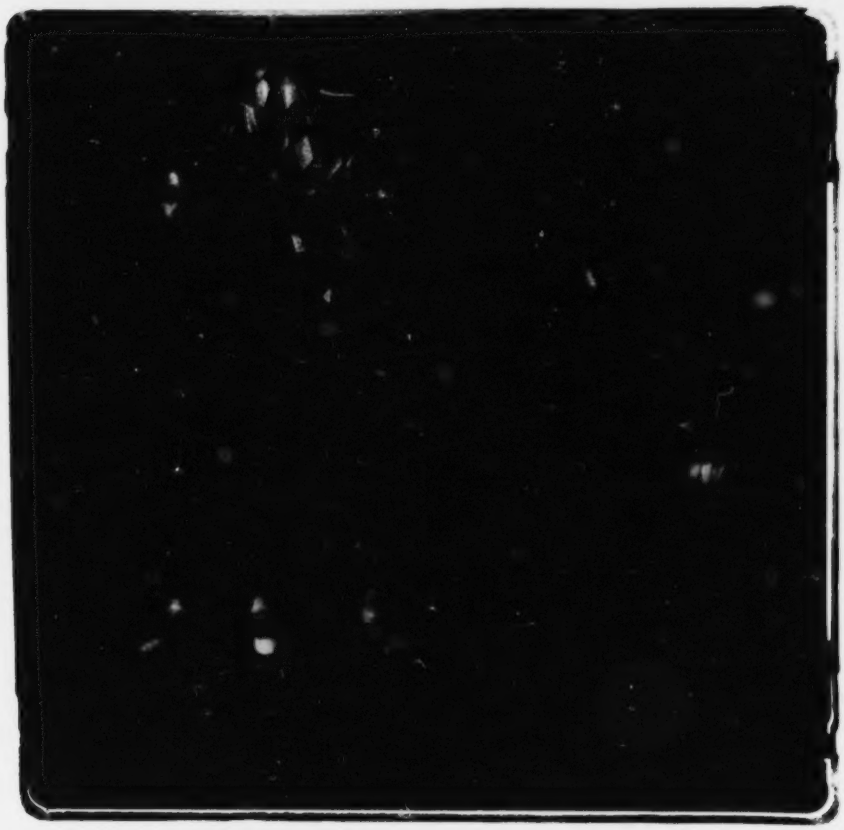
- What goals do students now have that are different from those they held at the beginning of the program?
- What changes do students envision in their attitudes, work, parenting, etc., that will result from the attainment of these goals?

Students actively participate in determining whether they have achieved the goals they set for themselves.

In *Women's Ways of Knowing* (Belenky, et al., 1986) the authors describe the silence that is imposed on large numbers of women from every social class (though with the largest numbers coming from the working class and the non-working poor), and how the need to break that cycle leads to adoption of what the authors describe as an alternative symbol system. Such systems may be provided by art, music, or activities that involve the individual in new cultural, social, or intellectual challenges, situations in which they may play an active role. The authors of this book are not optimistic about such change. They say, "Families that are relegated to the bottom of the class structure are often shaken by the collapse of an outmoded way of life. Values, symbol systems, and patterns of communication are torn asunder. Parents feel they have lost their way and have nothing to teach. One generation no longer tells its stories to the next." Such are the problems in the families of the program participants.

If, however, participants are to come to see their existing knowledge as an essential link to the changes they wish to make in their lives, the use of and respect for the knowledge must be provided in the programs from the beginning. "Occasionally women of lower-class origins who grew up in families characterized by silence, hierarchy, and violence were able to find strengths elsewhere. . . . On the whole, however, when poor families fail their children, the society provides little help; while children of privilege are more likely to find rich sources of sustenance to promote their development elsewhere."

Much of what is said in *Women's Ways of Knowing* points to social class and to the aspirations and values that typify class as the growing divide between those Americans who can find and live in the refuge of the middle class and those who are mired below the working class. It would be interesting to know – though I would suspect that such a project would not be fundable – what the profiles of successful women escapees from poverty look like, say, five years later. In the meantime, we might begin by developing the instruments and conducting the training to place assessment and evaluation of this group of excluded human beings on a more humane and responsive plateau.



Optimal Programming

Benita Somerfield

Literacy: "Using printed and written information to function in society to achieve one's goals and to develop one's knowledge and potential."

Literacy: Profiles of America's Young Adults,
National Assessment of Educational Progress (NAEP)

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Background: Stories from the Past

Literacy programs have a long history in the United States. Well before the Great Society legislation of the 60s, the military was providing basic skills training for its forces, night schools were providing English and citizenship classes for immigrants, and volunteers from community-based organizations (CBOs) and church groups were tutoring adults in their communities. It was, however, the Manpower Development Training Act (MDTA) of 1964 that laid the groundwork for many of the program design activities still going on today. MDTA mandated job training and basic skills education, resulting in a program design that consisted of ½ day of job-related basic education and ½ day of job training. Generic basic skills instruction was not encouraged, because program administrators believed that it would be of no use to the trainees who needed to find jobs; however, very few basic education teachers knew anything about the basic skills required for various jobs. No job task analyses had been done and the vocational instructors who handled the job skills training were only minimally helpful, since no formal communication mechanism between academic and vocational teams existed.

MDTA also provided for counseling and job placement activities; however, jobs were not often marketed in advance; also, linkages with the employer community were weak. Frequently, at program completion, trainees and counselors would read the want ads together, resulting in many placements that had nothing to do with the trainee's course of study or in no job at all.

In 1966, the Adult Education Act (AEA) was passed. The Act was and

remains the major federal program to provide basic education and literacy skills for adults in its target population, i.e., 16 years of age or over, out of school, and lacking sufficient educational skills to function effectively in society. No job placement requirement or any specific indicator of success was mandated; states funded the literacy programs that met their guidelines, which were usually those programs run by local education agencies (LEAs) rather than community-based or other non-traditional organizations. Results were typically stated in terms of reading and math score growth or high school equivalency (GED) test success.

One of the more successful programs of the late 60s and early 70s was the Public Service Careers Program in New York City. Recruiting specifically, although not exclusively, from welfare rolls, this program offered ½ day of basic education followed by ½ day of on-the-job training (OJT) as paraprofessionals in one of several areas: schools, hospitals, welfare centers. The job slots were marketed in advance. Basic education classes took place at the site of the OJT and continued until the trainee had passed the GED. Teachers often used the vocabulary, forms, and tasks encountered on the job in the classes. A counselor came in once a week for group sessions and was also on-call for individual problems. Once the GED test had been passed, the trainee would move to full-time employment; however, released time from the job was allowed for the trainee to continue at a community college for an associate's degree that matched the job requirements. Program retention was 70 to 80 percent. Follow-up activities showed more than 60 percent of the trainees still on the job 1½ years after it became a full-time activity.

Recent U.S. Department of Education surveys of exemplary literacy programs for adults reveal that the more effective programs combine basic skills and occupational training.

Today, although there is no longer a Manpower Development Training Act or a Public Service Careers Program, there is an increasing number of programs funded by the Job Training Partnership Act (JTPA), by corporations, and by small and mid-sized businesses that attempt to integrate basic skills with job preparation activities. Additionally, special funding for "workplace literacy" is included in the proposed legislation for the re-authorization of the Adult Education Act.

State interest in the link between basic skills proficiency, employability, and productivity has also resulted in a number of new activities. Last year the Council of State Policy and Planning Agencies (CSPA) ran two "academies" for ten states to design policies to "enhance literacy for jobs and productivity." Working with staff from the U.S. Department of Labor, the Division of Adult Education, and others, CSPA produced a policy guide that posed five questions:

- What are we trying to teach and why?
- Who are we trying to teach?
- How should the information be conveyed?

- Who should convey the information?
- How do we know that the skills have been learned?

Their research showed that effective adult literacy programs are able to answer these questions.

Effective Adult Literacy Programs: What Works?

In 1985, the findings of the National Adult Literacy Project (NALP), a major federally funded project that studied how exemplary programs work, were published. NALP staff had gathered and examined data from a survey of more than two hundred exemplary programs, from varied settings. Consistently, they found that the successful programs are the ones that are learner-centered. As David Harman points out in his book, *Illiteracy: A National Dilemma*:

> An appropriate educational program is one that caters to a specific group of participants, deriving its content and methods from the group's needs. Such a program would seek to address topics that are meaningful and desirable for its participants and would focus on helping them to realize the objectives they have set for themselves. Once achieved, the initial goals will be supplanted by others. Since the learning process is an unending one, adult learning should not be considered in terms of single discrete courses but rather as a lifelong undertaking that continually defines and re-defines its objectives, always on the basis of the learners' needs.

Equally important, programs that "worked" had total educational systems with the following characteristics:

- They are clear about their overall goals and their philosophy of instruction.
- They develop measurable goals for every component of the program so that they can monitor their success in meeting those goals. (Components are: recruitment and public relations, orientation, counseling, diagnostic testing, assessment, instructional methods and materials, follow-up, and program evaluation.)
- They assist potential learners in determining if the program is well-suited to the learners' goals and expectations.
- They are explicit about intended learning outcomes for participants and their standards for judging success in achieving outcomes, and this information is shared with program participants.
- They carefully diagnose each learner's educational needs and strengths and develop an individually tailored learning plan for each participant.
- They provide frequent feedback to learners on their progress in mastering their learning objectives and they carefully document that progress.

- They frequently evaluate their program's effectiveness in meeting its goals in each of the (key) component areas.

In recent surveys of exemplary programs conducted by the U.S. Division of Adult Education and the U.S. Department of Labor, other practices and characteristics of successful general literacy and workplace literacy programs have emerged. Programs that work:

- Target their audience carefully and design recruitment techniques that will reach them. Peer recruitment using current and past program participants seems to be most effective. This is as true for a CBO such as Push Literacy Action Now (PLAN) in Washington, D.C., as it is for the workplace program run by UAW-FORD in Dearborn, Michigan.
- Maintain flexible scheduling practices so that the students, most of whom do have other life demands as adults, don't miss out on instruction.
- Have teachers who also act as informal counselors and build supportive relationships with their students. In research findings, recently published in the *International Journal of Lifelong Education*, the project director found that lack of psychological support is often a key factor in adults' (particularly women's) lack of success in adult education programs. She found that providing support services such as transportation and child care is critical but not enough. Institutional and interpersonal support were also key.
- Build curriculum that reflects students' goals, interests, and needs. If that goal is a job, then the curriculum should include the skills and behaviors needed for the job.

Education programs for single mothers need to be learner-centered. The most effective programs are those that draw on the needs and strengths of the participants and that enable them to feel a sense of belonging.

Unlike the procedure followed in many of the early Manpower programs, employers should be brought in to help clarify the job needs of the community or, if possible, the job slots should be marketed in advance. The basic skills requirements of the jobs should then be determined and the curriculum built on that basis, using artifacts and simulations of actual tasks to be performed. These activities are best articulated in the functional context approach pioneered by Tom Sticht, whose work in the military indicated that "we can improve the capability of people by teaching basic skills embedded in job materials. Basic skills can be learned while you apply them."

Another curriculum model that shows promise, particularly for single mothers, is parent/child literacy. Although not currently targeted to employment, this approach, which works with both parent and child to improve general literacy skills and build parenting skills, clearly targets the intergenerational nature of the illiteracy problem. The work of Ruth Nickse at the Family Learning Center in Boston, Nickie Askov at Penn State, Alma Flor Ada in California, Julia Palmer at the Mother's Reading Program in New York City,

Mike Fox at PLAN, and the PACE program designed by Sharon Darling in Kentucky, all indicate that this is a model worth exploring.

- Build on the background knowledge of the students. Adults are not blank slates. Their past and present life experiences can be drawn on as the bases for instruction. Jon Deveaux at Bronx Educational Services, a nationally recognized exemplary adult literacy program, uses transcribed oral histories as the text for classes. Response from the students has been very enthusiastic.
- Create an "adult" atmosphere and a team spirit among staff and students. There is no "quick fix" prescription for the optimal literacy program. The best programs are responsive to the adults they serve and are therefore often somewhat idiosyncratic in their curricula and ambiance. There are, however, some things that we do know about good program design from past experiences and research, scant and "anecdotal" though they may be. The practices discussed and approaches suggested in this paper have proven effective in a number of contexts and can therefore be recommended for adaptation to others.

Note: The opinions expressed in this article are those of the author and do not necessarily reflect those held by the U.S. Department of Education.

Program Designs to Increase Basic Academic Skills

Lori Strumpf

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The Center for Remediation Design is a financial collaboration of the U.S. Conference of Mayors, the National Association of Private Industry Councils, the National Job Training Partnership, the National Alliance of Business, and the National Association of Counties. A few years ago these national organizations were concerned that there was no centralized service to assist Private Industry Councils (PICs) and Service Delivery Areas (SDAs), created under the Job Training Partnership Act, to meet the challenges of designing programs to improve basic academic skills for youth. Instead of inventing separate wheels, they joined forces to create the center, which provides training and technical assistance on their behalf to PICs, local elected officials, and professional staff involved in the employment and training system as well as the education system.

I have been asked here today to discuss optimal program designs that will increase basic academic skills among single teen mothers. I will focus on the lessons we have learned as to what works when designing programs intended to increase work-related basic academic skills of those most at risk of chronic unemployment.

I am not a researcher in the academic sense. I try to take the information provided by researchers, such as Public/Private Ventures (PPV) and Manpower Demonstration Research Corporation (MDRC), and apply this information to programs that are being designed and implemented around the country. I try to bridge the gap between what the research tells us is working and what that means for local program and policy development.

The observations I will share with you today are from the vantage point of providing on-site technical assistance to over 150 PICs and SDAs, conducting 14 two-day seminars on youth programs attended by over 600 professional staff, and managing a six-site PIC youth employment competency demonstration program and a three-site PIC/education collaboration demonstration program.

Most recently, through the work of the center, these observations are devel-

oped from providing on-site intensive technical assistance to 17 PICs and SDAs as they struggle to provide basic academic remediation services to the youth most at risk in their communities. The challenges faced in providing these services include developing true collaborations with schools, community-based organizations, and business so that the young people who are most at risk of dropping out of school, and those dropouts most at risk of chronic unemployment, will be provided the best each sector has to offer in developing comprehensive training and education programs.

Two planning elements are critical when developing a basic skill remediation program. The planning process must include thinking through how to define the target group and how they will be assessed before developing the delivery strategy. Who they are and how they will be identified will help to shape the service.

GOOD CASE MANAGEMENT IS PARTICULARLY IMPORTANT FOR A POPULATION SUCH AS LOW-INCOME SINGLE MOTHERS, WHO FACE AN ARRAY OF PROBLEMS AND OFTEN REQUIRE COORDINATED, INDIVIDUALIZED SERVICES.

DEFINING THE TARGET GROUP

Research indicates that many factors play a role in whether a young person will drop out of school, including:

- Academic history;
- Survival factors (marriage, pregnancy, etc.);
- Social factors (incarceration, drug dependency, etc.); and
- Environmental factors (socioeconomic status, home support, etc.).

Current studies show that while all of these factors are related, if any one has a singular predictive value it is academic history. Early detection of basic skills deficiencies may provide better identification of potential dropouts rather than using other singular indicators, such as socioeconomic status. Early detection of basic skills deficiencies among youth who are not in school may also provide better identification of those most at risk of chronic unemployment.

It is critical, for the purposes of designing basic skills remediation programs, to further define the target group – in this case teenage mothers – based on need. Everything we know suggests that what youth at risk need are basic skills and work-related experience. Further definition of target groups based on their lack of basic skills provides us with four potential subgroups, any or all of whom we may design a remediation program for. The subgroups may be identified as:

- All who are deficient;
- Deficient in-school youth;
- Deficient dropouts; and
- Deficient out-of-school youth.

While we know that being pregnant and/or having a child increases the likelihood of dropping out of school, being a member of the group "teen

parent" alone does not necessarily mean that the youth is deficient in the basic skills necessary to get and keep a job or to enter further training. To develop the basic skills component of an overall delivery strategy serving teenage mothers requires a basic academic skills assessment that will identify skill deficiencies. This way of targeting is a key planning element which sets up two principles upon which the delivery strategy will be based:

- Youth should be taught what they need to know, not what they already know;
- Identification of where learning begins is the first step in ensuring that assessment, curricula, and instruction are connected.

Assessment

Assessment is a multistep process producing information on a participant that can be used for many program purposes. Each level of assessment provides information on how much movement a youth has made toward employability. An effective assessment strategy that identifies deficiencies in basic skills and work skills will have the following steps:

1. Appraisal (screening) — Provides an immediate snapshot of current abilities. This information may lack specificity but assists program operators in deciding which youth may need remediation and therefore may need further assessment.
2. Individual diagnostic — Having determined which level or what intensity of training may be in order, more extensive assessment may provide information on specific skills in which a youth is deficient. This information determines where — exactly — the learning should begin. This step functions as the "pre-test." At this point a fairly prescriptive employability development plan should be formulated.
3. Progress checks/benchmarks — This type of assessment provides program operators with information on how well a youth is progressing in the program and indicates when specific goals are met for the purpose of program exit. For the participants, benchmarking progress serves to reinforce learning and focuses on accomplished goals.
4. Certification test — This test is designed to verify competency attainment. This step functions as the "post-test."

Program Design Principles

What are the design principles we have seen work in programs around the country, which, if implemented, help to ensure a successful basic skills remediation program? What principles are basic to programs serving those most at risk of chronic unemployment because they lack basic academic skills and

work skills? Whether these are programs for youth still in school or for those who have already dropped out, the principles have proven effective when used as a guide to plan, design, and implement basic skill remediation programs. These principles facilitate one-to-one interaction.

Programs for the most at-risk youth must combine work or life skills and learning; provide intensity of training; be delivered through alternative instructional methodologies and alternative settings; be open-entry/open-exit, and finally be individualized, self-paced, and competency-based. In addition, a commitment must be made to develop long-term evaluation strategies that examine program and participant success. The information from these evaluations can be used to identify problems and build on successes.

These principles must be implemented in basic skills remediation programs, regardless of whether the program is for teen parents or any other group. These principles, when built into a delivery strategy, assist in decreasing basic skill deficiencies among at-risk youth. In addition, programs targeted on teenage mothers who are deficient in basic skills must provide support services such as day care. Just as the need for child care can prohibit a young woman's ability to go to work, it can prohibit taking advantage of training opportunities.

In training single mothers, services must be integrated into a program which has education and employment at its core, and must include child care services, optimally on-site, but certainly within the community, and training in parenting and family planning.

I would like to briefly examine each of these design principles and discuss how they have been built into actual program designs.

What does it mean to combine education, living skills, and work? Overall, it means implementing a philosophy through staff of the program that constantly makes the connections for young people about what the program teaches and how that relates to work. In a more specific sense, it means designing basic skills curricula and instructional methodologies that teach basic academics through functional or work- and life-related activities.

Work can be integrated into a sequential design that links educational services provided in the year-round school programs to summer work experiences. One example combining learning and work is to make a certain number of summer jobs available to youth who achieve certain milestones in the educational component. This strategy may be motivating to certain youth, particularly if there are more youth than jobs available during the summer. Work can also be provided concurrently with learning through provision of actual experiences working or through job-specific skill training.

A critical element to actual work experiences is to orient employers so that they "buy in" to the program philosophy. Buying in means that employers, along with the teachers, will be making work/education connections. This can be done on a variety of levels, from having the employer simply ask every day "Did you go to school today?" to actually teaching some basic skills at the very moment the young person is performing a job-related function.

The amount of time a young person spends in a basic skills remediation program, as an isolated factor, is not as important as how intense or concentrated the program is. The program's success will not be just a function of its duration but depends a great deal on how intense each service component is.

Combining work and learning in a structure that makes "moment to moment" connections begins to develop the intensity of the program. Learning that occurs in small units with immediate payoffs builds intensity. Providing support services to youth that allow them to work out any job-related, home-related, or education-related problems continues to build up the intensity of the program's structure.

To successfully implement an intensive service delivery strategy means paying attention to the staffing pattern of the program. Staff-to-participant ratios must be reduced both at worksites and in the educational environment to allow for more intensive interaction. Teachers may need to have different kinds of credentials and job descriptions than are necessary for traditional classroom settings.

The intensive nature of a basic skills remediation program needs to be managed. A case management approach is necessary to ensure the quality of the curricula, to keep youth motivated and to identify barriers to participation. Teachers, counselors, and worksite supervisors must have a formal mechanism for communicating with each other. One of these individuals – most often the counselor – is the focal point for all information.

Providing basic skills in an open-entry, open-exit, competency-based format builds intensity into the curricula for the program. A commitment to open-entry/open-exit means that "seat time" is not important. "Time on task" is the critical structural issue.

"Competency-based" means providing young people with an opportunity to learn what they need to know, not what they already know. True competency-based instruction provides for adequate assessments and learning plans, which start where the youth is currently and allow the youth to finish when their goals are accomplished for that component part of the program. Youth then move into the next service sequence at their own pace, not in relationship to others in the "class."

One instructional method that assists in building intensity into program designs and is helpful in keeping the curriculum individualized and open-entry/open-exit is computer-assisted instruction.

To implement many of the preceding principles means developing learning settings that are non-traditional. Two structures to deliver educational instruction come to mind: in the classroom and at the worksite.

To provide a non-traditional environment within a structure where youth

must go to the learning environment means changing everything about the traditional classroom. Many of these changes have been discussed previously (such as a functional curriculum) that make learning more meaningful. Non-traditional classrooms, particularly for dropout youth, may mean paying special attention to where the building is located, for ease of access as well as for the mental connotations a building on the grounds of the local high school may conjure up.

The second structure that can be used to deliver educational instruction is at the worksite. This strategy can take on a variety of forms: a room provided by the employer that youth use during their work day and is staffed (taught) by the employer's personnel; a mobile classroom where teachers and materials come to the worksite to provide instruction; and learning that occurs at the same time a job function occurs – i.e., supervisors who can teach math functions while a cabinet is being built. Several key elements are crucial to the success of worksite training programs that teach basic skills:

- Work assignments that are real, with pay for work;
- Work discipline so that missing work or coming late has consequences;
- Strong work supervision; and
- Understanding of work expectations and regular review.

In either setting, true implementation of these design principles will assist in developing a "curricula management system" to ensure that assessment information will be used to develop individual plans that relate the individual's skill deficiencies to written materials and instructional techniques.

Conclusion

The nation no longer has a choice. Those most at risk of becoming chronically unemployed due to a lack of basic education skills and work skills are those to whom our economic future falls. Many youth are not learning what they need to know to function in a changing labor market, as well as in daily life, through traditional school structures. Community institutions, particularly the schools, must be reshaped to meet the needs of those most at-risk.

Schools must treat these youth in an individualized fashion, addressing differences in learning styles and adapting non-traditional instructional methodologies that address individual needs. Smaller student/teacher ratios must be mandated to ensure one-to-one interaction. Many youth who are identified as at-risk because of basic skills deficiencies also face serious challenges in being able to participate in school or training, such as the need for child care. Support services that create the opportunity to participate must be in place, either within the community or within the educational environment. The full curriculum in schools, both that which is taught directly and that which is indirect,

such as discipline policies, should teach youth to analyze and solve problems rather than to respond en masse to bells and group instruction.

The challenge placed before us is to ensure that youth have the skills they need to become employed and that the community institutions responsible for assisting youth keep the focus on those most at risk of chronic unemployment. Nothing less than restructuring may be necessary to meet the challenge. All youth, whether they are teen parents, poor, substance abusers or otherwise, must be viewed as a national resource and as a strategic investment. An investment in the development of their basic academic skills today will provide for a more productive society tomorrow. We know enough for action. We can learn more if we act now on what we know about good program design and if we continue to evaluate our strategies.

Seminar Agenda

9:00 A.M.

Welcome and Introductions
Rebecca Maynard

Statement of Purpose
Phoebe H. Cottingham

Presentation: The Female Single-Parent Literacy Project
Cynthia Marano

10:00 A.M.

Panel Discussion
The Economy and Workplace Skills: New Demands
Sue Berryman
Raymond Uhalde

Respondent: Nathaniel M. Semple
Moderator: Judith Gueron

11:45 A.M.

Lunch: Roundtable discussion
with literacy service providers

1:15 P.M.

Panel Discussion
Strategies for Designing Literacy Programs for Single Mothers
Benita Somerfield
Lori Strumpf

Respondent: Ruth Nickse
Moderator: Michael Bailin

3:00 P.M.

Panel Discussion
Literacy Skills Measurement and Program Evaluation
Tom Sticht
Richard Sterling

Respondent: Gordon Berlin
Moderator: Rebecca Maynard

4:30 P.M.

Conclusion and Final Remark

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